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Heat Stress During Operation Banyan Tree I

By

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In Operation BANYAN TREE I, 1500 unacclimatized paratroopers were flown from Fort Bragg, North Carolina, to Panama where they parachuted and engaged in a strenuous 2-day combat exercise against seasoned Army units stationed in Panama.

Measurements of body weight, pulse rate, oral temperature, urine volume, urine specific gravity, and urinary electrolytes were made on a test squad of ten men on two successive days before the operation, once during the flight to Panama, on both days of the exercise, and finally one week after its return to Fort Bragg. Results indicated that these physically fit but unacclimatized men experienced significant degrees of dehydration, accompanied by reduced urinary volume, and depletion of urinary electrolytes, as well as elevation of oral temperature and resting pulse rate. Clinical symptoms of muscle cramps in one subject together with low urinary electrolytes in all subjects suggests the presence of marginal salt deficiency. In comparing them with control subjects, observers noted serious impairment of combat efficiency. Because rapid movement of troops from one climate to another is contemplated in modern concepts of limited war, these findings suggest the need to devise methods for enhancing heat tolerance and for preventing dehydration in unacclimatized combat units.

INTRODUCTION

ON 19 February 1959 at 0730 hours, the 2nd Battle Group, consisting of some fifteen hundred paratroopers of the 501st Airborne Infantry from Fort Bragg, North Carolina, parachuted to a drop zone near Rio Hato, Republic of Panama, and engaged in a strenuous two and one-half day combat exercise against a simulated aggressor force composed of Army units stationed in the Canal Zone. This exercise, known as Operation BANYAN TREE I, offered an opportunity to observe effects of heat stress in a group of physically fit but unacclimatized young men rapidly transported from a cool climate to a tropical climate. A preliminary report has already appeared.[1] The present report provides additional details obtained in this field study and may thus provide baseline data for current studies of heat acclimatization being conducted by Army medical scientists during Operation BANYAN TREE III (February 1961).

A preliminary report of this work was presented before the 24th Annual Congress of the International College of Surgeons, Chicago, Ill., Sept. 1959.

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Methods

A test squad of 10 men were selected from Company "C" of the 2nd Battle Group at Fort Bragg. Two sets of baseline data including body weight, oral temperature, resting pulse rate, and timed urine samples were obtained from 1400 to 1630 hours on 16 and 17 February (Samples A_1 and A_2) (Fig. 1a, b, c). Daily maximum temperatures at Fort Bragg from 1 through 17 February averaged 56.8°F (35.2-69.5°F.).

On the evening of 18 February the Battle Group with full equipment boarded transport planes. One of the authors (G.A.G. Jr.) accompanied the test squad as the observer. Between 0210 and 0300 hours on 19 February while in flight a third sampling was obtained of all measures except body weight (sample B) (Fig. 1a, b, c). Temperature conditions in the after part of the troop compartment were described as uncomfortably cold, a result of some defect in heating equipment. About half of the test subjects were located here. Actual temperatures in the compartment, however, were not recorded.

At 0730 hours on 19 February, the test squad and the observer parachuted to the drop zone near Rio Hato and proceeded to a designated assembly area. At 1200 hours after a meal of "C" rations the test squad with "C" Company following proceeded at a rapid pace to seize their first objective. This was achieved at 1500 hours. Intense physical effort was required to traverse rugged terrain which provided essentially no shade.

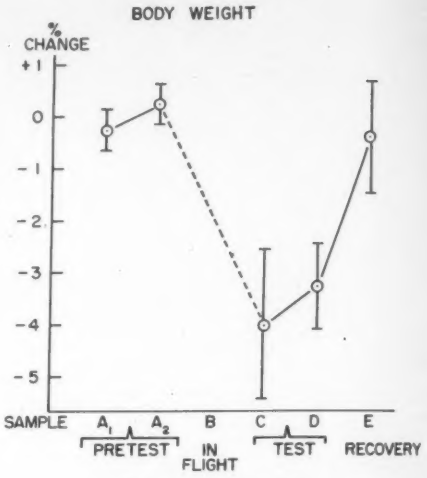

Fig. 1a. Body weight.

Weather conditions at an instrument station located at the drop zone were recorded hourly from 0700 to 1700 hours on 19 and 20 February. Table 1 lists these data together with an evaluation of heat stress in

Table 1

Hourly weather conditions at drop zone, Rio Hato, Panama during operation Banyan Tree I, 19 and 20 February 1959

Hour	Dry Bulb T.		Wet Bulb T.		Black Globe T.		Wind Vel. (Hourly Av.)		WBGT Index	
	Feb. 19	Feb. 20	Feb. 19	Feb. 20	Feb. 19	Feb. 20	Feb. 19	Feb. 20	Feb. 19	Feb. 20
0700	71.5	70.0	70.0	68.0	69.0	70.0	4	4	69.9	68.6
0800	76.0	77.0	73.0	72.0	89.5	95.0	4	5	76.6	77.1
0900	82.0	81.0	73.0	71.0	105.0	101.0	5	5	80.3	78.0
1000	83.0	86.0	73.0	72.0	102.0	110.0	7	7	79.8	81.0
1100	81.5	90.0	74.5	72.0	106.0	108.0	10	12	81.5	81.0
1200	85.0	92.0	74.5	73.0	105.0	106.0	10	15	81.6	81.5
1300	85.0	90.0	75.0	72.0	103.0	108.0	10	15	81.6	81.0
1400	86.0	94.0	75.0	73.0	102.5	107.0	15	17	81.6	81.9
1500	87.0	90.0	75.0	73.0	102.0	103.0	12	17	81.6	80.7
1600	86.0	89.0	75.0	72.0	100.0	98.0	12	17	81.1	78.9
1700	85.0	86.0	75.0	71.0	98.0	94.5	10	17	80.6	77.2

terms of the Wet Bulb-Globe Temperature Index* of Yaglou.[2]

The first physiological measurements during the exercise were made at 1715 hours on 19 February (sample C) (Fig. 1a, b, c). The test squad was inactive during the night of 19 February and Company "C" reverted to battle group reserve the following morning. This provided the subjects an opportunity to rest in a shaded area.

At 1400 hours on 20 February orders were received to march approximately 6 miles to a new position. This was accomplished by 1630 hours. At 1715 hours on 20 February measurements again were made (sample D) (Fig. 1a, b, c).

The exercise ended at 0610 hours on 21 February. Recovery measurements were made at Fort Bragg between 1350 and 1550 hours on 3 March, approximately one week after the 2nd Battle Group had returned from Panama.

Eight subjects stationed in Panama who participated in the exercise as "aggressors" served as a control group. The pre-test measurements (Fig. 2) were made at 0800 hours on 18 February (sample A), the test measurements at 1740 hours on 19 February (sample C) and recovery measurements at 0930 hours on 4 March (sample E).

Urine samples were analyzed for sodium and potassium by flame photometer and for chloride by the method of Schales and Schales.[4] All analyses were performed by one technician at the Naval Medical Research Institute in Bethesda.

Results

The results of these tests are shown in the accompanying figures (Figs. 1a, 1b, 1c and Fig. 2). Average food and water intake per man for the hours from 0800 to 1600 for 19 and 20 February are presented in Table 2. These latter values must be regarded as rough estimates only, being limited by the accuracy of recall by the subject.

In Figs. 1 and 2, the points on each curve are mean values whereas the bars represent the standard deviation from the mean.

Evaluation of the data for the test squad from Fort Bragg indicates that with the exception of urinary excretion of potassium, all measurements taken during the two days of the test differ in a statistically significant manner from both the pre-test

*The Wet Bulb-Globe Temperature (WBGT) Index expresses environmental heat stress as a single value derived by weighting individual temperature readings (°F) as follows: WBGT Index = .7 wet bulb t. + .2 black globe t. + .1 dry bulb t. A value of 85 is the level at which vigorous training is curtailed in unacclimatized recruits.[3]

Table 2

Food and water intake during operation BANYAN TREE I

0800–1600 Hours
19–20 Feb 1959

Group	Food Intake per Man			Water Intake per Man	
	Cans of "C" Rations		Candy Bars	Canteens*	
	Hard Rations	Fruits		Range	Average
Test Subjects					
19 Feb	½	½	½	.75 to 1.5	1.25
20 Feb	2	1	1	1 to 5	2.5
Control Subjects					
19 Feb	1	1	0	1.25 to 2.0	1.5
20 Feb	NOT REPORTED			NOT REPORTED	

*All men, including test subjects, had received orders to take two salt tablets with each canteen of water.

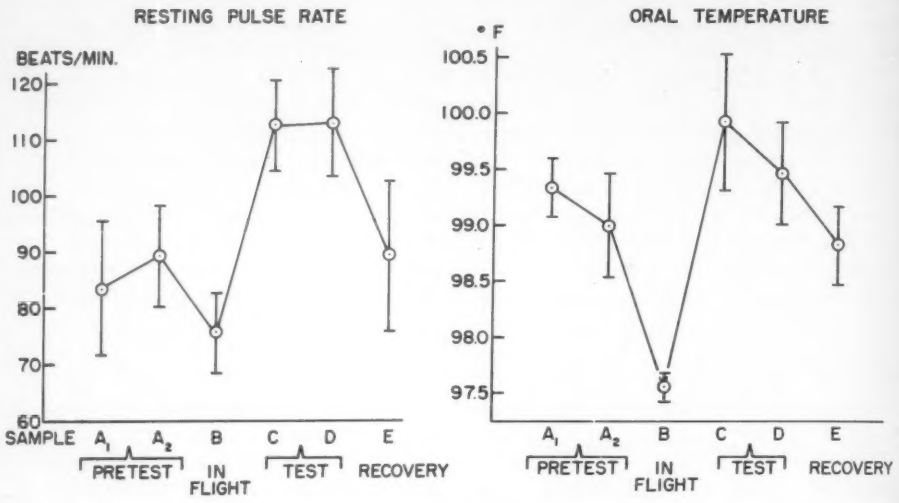

FIG. 1b. Pulse and temperature.

samples A_1 and A_2 and from the recovery samples E. The differences in the B samples as compared with A_1 and A_2 are of interest (see discussion) and for some measures, these differences are also significant.

In contrast, measurements in the control group taken on 19 February during the exercise (sample C) either do not differ significantly from the pre-test and recovery measurements, or show no trend consistent with the phase of the exercise (Fig. 2). The drop in body weight between A and C cannot be explained. However, the A measurements may have been in error since no change occurred between C and E. Moreover, it should be noted that whereas all weight measurements in the test group were taken at approximately the same time of day in each phase (Fig. 1a), this was not the case in the control group (Fig. 2), a fact which may account for the inconsistency in body weights for the control group.

DISCUSSION

These data indicate that relatively mild tropical heat stress imposed on physically fit but unacclimatized young paratroopers engaged in a combat exercise results in a significant degree of dehydration as indicated by a mean loss of 4% in body weight, together with marked reduction in urine volume, an increase in urine specific gravity, and a deficiency in urinary excretion of sodium and chloride. Inversion of the sodium to potassium ratio suggests an endocrine response to this stress. Associated with these findings is an elevation both of oral temperature and of resting pulse rate. Eleven days after the exercise and 7 days after the test squad returned to Fort Bragg, all measurements had reverted to pre-test levels.

The impact of environmental heat on thermoregulatory mechanisms of unacclimatized but healthy young men required to perform moderate work in the heat has been extensively studied in the laboratory[5] and in the field.[6] Eichna *et al.*[5] observed physiological strain in men marching in a hot room under conditions of extreme heat for periods of 4 hours. Intolerance of unacclimatized men to heat was manifested by elevated body temperature, accelerated heart rate and instability of blood pressure as compared with corresponding measurements taken during work in cool conditions. Work capacity was reduced and some subjects failed to complete the full work schedule.

Daily exposures to work in the heat increases heat tolerance with progressive de-

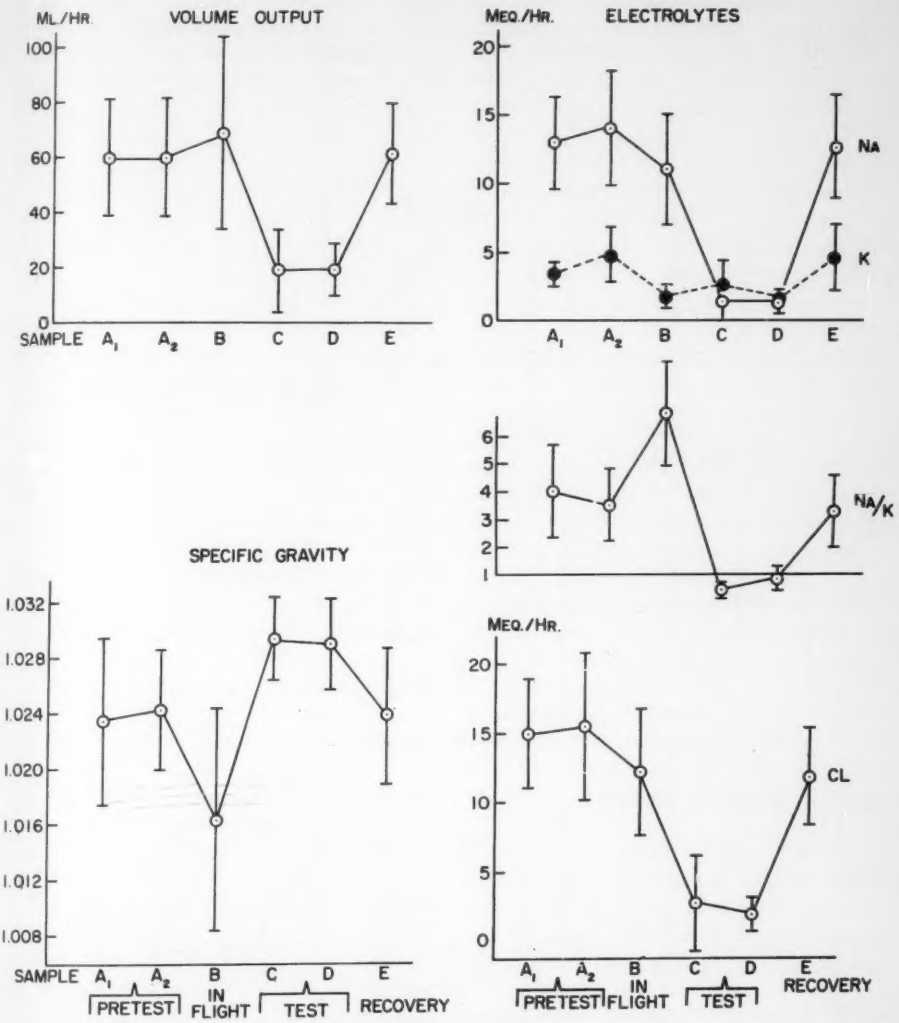

FIG. 1c. Urinary findings.

FIGURE 1a, b, c

Results of measurements in ten test subjects from Fort Bragg. Points are means of 10 measurements. Bars represent standard deviation from the mean. One subject was lost to test C.

A_1 and A_2 Pre-test sample taken 16 and 17 February at Fort Bragg.

B Inflight sample taken 0210-0300 hours 19 February.

C Test sample taken 1715 hours on 19 February, Exercise Area, Panama.

D Test sample taken 1715 hours on 20 February, Exercise Area, Panama.

E Recovery sample taken 1430-1630 hours, 3 March, Fort Bragg.

Figure 1 (a) Body weight as per cent change from mean of pre-test weights.

1 (b) Resting pulse rate and oral temperature.

1 (c) Urinary findings.

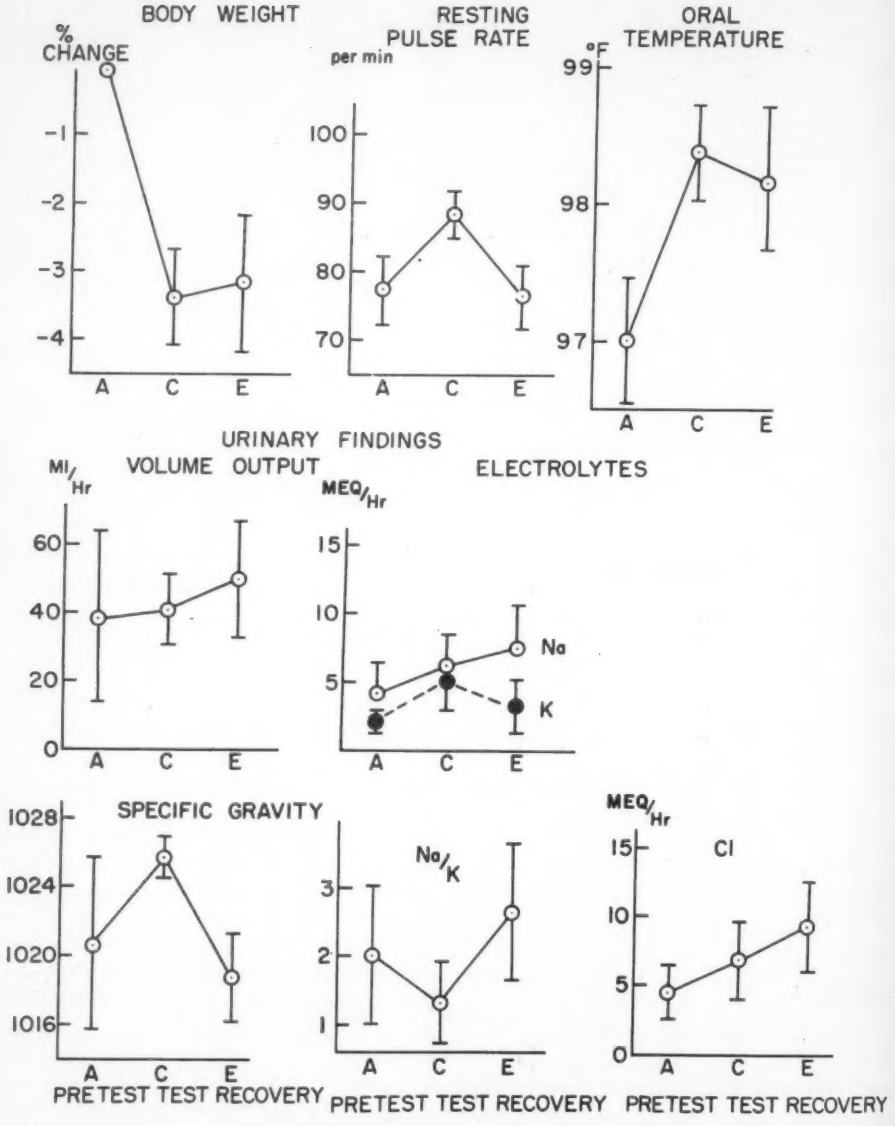

FIG. 2.

Results of measurements in eight control subjects from Army Units in the Canal Zone. Points are means of 8 measurements in A and B, 7 measurements in C, and 6 measurements in E.

A Pre-test sample taken 0830 hours 18 February.

C Test sample taken 1740 on 19 February at Exercise Area.

E Recovery sample taken 0930 hours 4 March at Fort Gulick, Canal Zone.

cline in heart rate and body temperatures toward levels observed in cool conditions. These changes are associated with increased rate of sweating and improved stability of blood pressure. Capacity to work in the heat is thus increased. Acclimatization requires 7 to 10 days.[5]

Unless water is replaced in an amount equal to that lost in the sweat and urine, heat tolerance even in acclimatized men is reduced.[5] Elevated body temperature and higher pulse rates are indices of the greater physiologic strain which a water deficit imposes on thermoregulatory mechanisms.[5,6,7] Suppression of sweating has been reported in dehydrated subjects[7,8,9] and may in part account for the impairment in physiological adaptation to heat observed under conditions of water deficit.

Salt deficiency alone, even though water intake is maintained during active sweating, leads to a form of dehydration characterized by severe circulatory disturbances.[10,11,12] Muscle cramps may[10] or may not[11] be an associated symptom.

Dehydration from water restriction alone or in combination with salt deficiency is an etiologic factor of primary importance in clinical forms of heat exhaustion.[6,10,11,12]

Dehydration observed in the test subjects on the first day can be largely attributed to involuntary water restriction. Through logistics failure, the water trailer assigned to accompany the unit to which the test squad was attached did not arrive at the advanced position until about 1730 hours. Therefore the only water available to each subject for the period from 1200 to 1730 hours on 19 February was that which he carried in his canteen (Table 2). All complained of thirst. During the following 24 hours, however, ample water was available. The failure of the subjects to restore body weight deficit must thus be attributed to so-called voluntary dehydration, which has been described by Adolph *et al.*[6] and others.[5] These investigators have demonstrated that thirst is indeed a poor index of body needs for water, particularly in those unaccustomed to a hot climate. The weather did not differ significantly in terms of heat stress on the two days of the exercise (Table 1) and the tactical requirements were less demanding on the second day. To prevent dehydration, therefore, it is necessary to instruct men to drink water somewhat in excess of the amount required to satisfy thirst.

The urinary findings in themselves do not necessarily establish the existence of a serious degree of dehydration nor a significant depletion of body salt because changes of these magnitudes may be observed in men during periods of active sweating while working in the heat[6,13,14] even when maintained in positive water balance.[15] The urinary findings, however, acquire added significance in light of the weight loss and the signs of circulatory and thermoregulatory strain. Inversion of the Na/K ratio may indicate adrenocortical activation.[14] The presence of heat cramps as a symptom in one test subject who became a heat casualty on the first day is suggestive evidence that salt deficiency did exist in this case. The extent to which salt depletion prevailed in the other subjects would have required measurements of plasma electrolyte levels. These were not performed. Muscle cramp, however, was a symptom in three of four other heat casualties interviewed by one of the authors.

The question whether the output of a relatively large urine volume of low specific gravity while in flight (sample B) may have contributed to depletion of body water and salt is an interesting matter for speculation. Cold diuresis resulting from exposure to the chilly environment in the after part of the troop compartment of the plane may indeed have been a factor which produced a urinary pattern distinct from the other tests. The borderline significance of these changes can perhaps be attributed to the fact that only half of the subjects were exposed to the cold conditions.

Two of the authors witnessed the operation as observers, one from the standpoint of a line officer (G.A.G. Jr.) and the other from that of a medical officer (R.C.S.). In the opinion of both, combat effectiveness of

the paratroopers from Fort Bragg was seriously impaired on 19 February.

In arriving at this judgment, they were necessarily unable to apply objective quantitative criteria. Such assessment of human performance under stress is difficult at best, even under laboratory control. Nevertheless, in comparing the paratroopers from Fort Bragg with soldiers from units stationed in Panama, the observers were impressed by striking differences in the speed and precision with which the two groups performed their tasks. The unacclimatized men appeared "sluggish and listless under conditions requiring vigorous action. By 1500 hours on 19 February many of the test subjects seemed on the verge of exhaustion."* Those required to carry heavy loads such as the machine gun and radio equipment suffered most. Acclimatized men in the "aggressor group" by contrast were observed to advance toward their objectives with speed, surmounting obstacles in the terrain with relative ease, and exhibiting few if any of the usual outward signs of excessive strain (labored breathing, flushed facies, etc.).

It is evident therefore that the test group differed from the control group, first, in exhibiting signs of water depletion together with indications of thermoregulatory strain, and second, in the reduced competence to perform tasks required by the tactical situation.

After action interviews with members of the test squad uncovered a characteristic set of symptoms which occurred between 1200 and 1730 hours on 19 February. This may be described briefly as thirst, sensation of oppressive heat, loss of appetite, and extreme fatigue. Without qualification, each subject described the climate as the hottest in his experience. As Table 1 indicates, actual weather conditions were comparatively mild which suggests that the subjective reaction was a symptom of severe physiological strain rather than a valid assessment of the thermal environment. One test subject was evacuated as a heat casualty at 1430 hours on 19 February with a diagnosis of heat cramps. He did not return to duty with his squad until after the "C" sample had been taken (see caption, Fig. 1).

During the 2-day exercise fifteen heat casualties, all from the 501st Battle Group, were evacuated to aid stations or to the collecting station. Examination of four of these casualties by one of the authors (R.C.S.) revealed signs and symptoms of moderate to severe heat exhaustion with heat cramps as a symptom in three of the four cases examined.

Had Operation BANYAN TREE I been an actual encounter with an enemy trained under tropical conditions, it is apparent that the defenders flown in from the cool winter climate of Fort Bragg would have operated in combat under a serious handicap, not through lack of training, physical fitness, or motivation, but rather through lack of acclimatization to heat with an added burden on their thermoregulatory mechanisms imposed by uncompensated losses of body water and possibly of body salt, as well.

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* From the after action report by G.A.G. Jr.

data and pyreheliometer records for the period of the exercise, for which we are extremely grateful. Finally we wish to thank Captain Herschel C. Sudduth, MC, USN, Head, Experimental Medicine Branch of the Physiology Division, NMRI, and J. D. Brown, HMC, USN, who performed the chemical analyses.

References

[1] Minard, D., Grayeb, G. A., Jr., Singer, R. C. and Kingston, R. J.: Res. Rep. NM 41 01 00.01.02 Nav. Med. Res. Inst. Repts. 17: 467, 1959.

[2] Yaglou, C. P., and Minard, D.: A.M.A. Arch. Indust. Health 16:302, 1957.

[3] Minard, D., Belding, H. S., and Kingston, J. R.: J.A.M.A. 165:1813, 1957.

[4] Schales, O. and Schales, S. S.: J. Biol. Chem. 140:879, 1941.

[5] Eichna, L. W., Bean, W. B., Ashe, W. F., and Nelson, N.: Bulletin Johns Hopkins Hosp. 74:25, 1945.

[6] Adolph, E. F., *et al. Physiology of Man in the Desert.* Interscience Publishers, Inc., New York, 1947.

[7] Pitts, G. C., Johnson, R. E., and Consolazio, F. C.: Am. J. Physiol. 142:253, 1944.

[8] Ellis, F. P., Ferres, H. M., and Lind, A. R.: J. Physiol. 125:61P, 1954.

[9] Leithead, C. S., and Pallister, M. A.: The Lancet 2: 114, 1960.

[10] Talbott, J. H.: Medicine 14:323, 1935.

[11] Taylor, H. L., Henschel, A., Mickelson, O., and Keys, A.: Am. J. Physiol. 140:439, 1943.

[12] Ladell, W. S. S.: Trans. Roy. Soc. Trop. Med. and Hygiene 51:189, 1957.

[13] Lichton, I. J.: J. Appl. Physiol. 11:223, 1957.

[14] Robinson, K. W., and Macfarlane, W. V.: J. Appl. Physiol. 12:13, 1958.

[15] Wyndham, C. H., Bouer, W. v.d. M., Devine, M. G., and Paterson, H. E.: J. Appl. Physiol. 5: 285, 1952.

MEETING IN JAPAN

The Far East Session, American College of Physicians, was held at the U. S. Naval Hospital, Yokosuka, Japan, recently. Approximately 150 American and Japanese physicians attended. American military medical officers from Taiwan, Korea, Guam, Korea and the Philippine Islands, as well as from Japan, attended. There were approximately 50 eminent Japanese physicians, including professors from a number of medical schools in Japan.

The official guest was Dr. Phil R. Manning, Associate Dean and Director of the Postgraduate Division, University of Southern California School of Medicine. Professor Hideo Ueda of the Faculty of Medicine, University of Tokyo, discussed modern medical education in Japan.

The Medical Problems Encountered in Antarctica

By

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FOR THE past six years the Navy's Operation DEEP FREEZE has annually deployed to Antarctica. The first four years Naval Support Force, Antarctica under Admiral George Dufek supported the U. S. scientific effort of the Third International Geophysical Year, while the last two years the same organization under Admiral David Tyree has logistically supported the continuing Antarctic Research Program of the National Science Foundation.

During this time 1200 men have "wintered over" on the continent, spending approximately one year each at one of seven bases, four of which are now under U. S. operations. Each Austral summer civilian and service scientists, seamen, stevedores, builders, airmen and supervisory personnel now totalling between 16,000 and 17,000 men have journeyed to the continent to study the continent and to resupply, reman, rebuild, and logistically support this effort. The average stay of these summer "tourists" is about two months.

Complete statistics on the first five years of this polar operation were collected, showing what medical conditions are suffered by men living within the Antarctic Circle. These statistics have been of increasing use in teaching young doctors, and in concentrating our attention on better ways to treat these conditions. They serve as a guide for practical and economical medical resupply. Above all they direct the attention of the surgeon in preventive polar medicine. The polar surgeon is in many respects like a lifeguard who seems to spend most of his time directing traffic, stopping dog fights, answering questions by the thousand, and sweeping out locker rooms. When occasion arises however, the guard must be able to quickly and efficiently rescue the drowning, and to expertly apply resuscitative measures should they be necessary. Practically the lifeguard's most lasting contribution to society lies in his *teaching* of swimming, lifesaving, and water safety.

Since the Antarctic continent was discovered a little over 140 years ago, there have been 139 deaths south of the Antarctic Circle, 85 of them within the past 20 years (Fig. 1). The first recorded loss of life in Antarctica was the disappearance in 1839, south of Cape Horn, of one of Wilkes' ships, the USS SEAGULL with all 24 hands aboard. This was in the days of "iron men and wooden ships," yet in October 1958, going to the rescue of a man with appendicitis in the same Palmer Peninsula area, the Argentine ship Guarani disappeared with 36 men aboard. From what specific causes these men died can only be surmised.

Aircraft crashes with 20 deaths (17 Americans) leads the specific causes. Drownings, 6 from sea ice breakup, 6 from vehicles going over ice shelves or through sea ice, and 4 from varied causes is second. Two fires have claimed 10 lives. Nine have starved or died of scurvy. Crevasses have claimed 7; four froze to death lost in blizzards. Only four men have died of disease (all before 1903). These were believed to be two heart cases, one tuberculosis, and one appendicitis. Three have died in shipboard accidents, two have been crushed by vehi-

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The opinions expressed in this paper are those of the author and are not to be construed as policy of the Department of Defense or the Department of the Navy.

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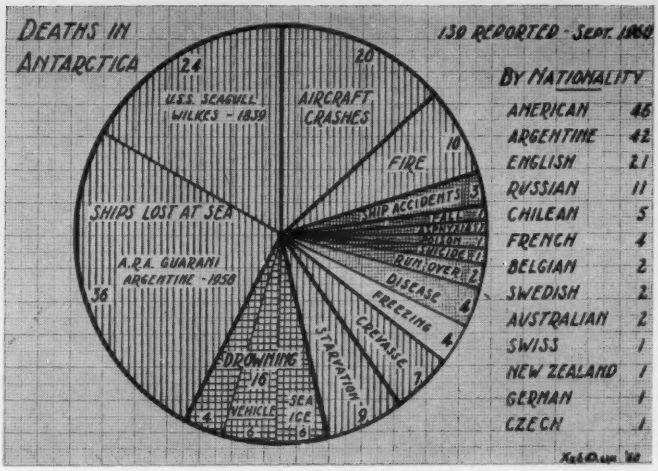

FIG. 1. Deaths in Antarctica.

cles. A fall, a cooking gas asphyxia, a methyl alcohol poisoning, and a suicide have accounted for one man each.

Accidental and violent deaths may be reduced in number, by thorough and intensive training in aviation, ice, and cold water safety and survival.

Study of Fig. 2 shows the causes of U. S. deaths in Antarctica since 1946. Eight out of the 17 crash deaths have been due to flying in white-out or in marginal weather. This fact stimulated the optical research which culminated in a new metallic coated yellow glass now successfully used by pilots and trail personnel to combat white-out.

This chart shows that Antarctic flying is eight times more deadly than average Navy flying. There is three times the possibility of drowning in Antarctica as elsewhere in the Navy. Yet there is only one-third the possibility of dying in an Antarctic ground vehicle accident.

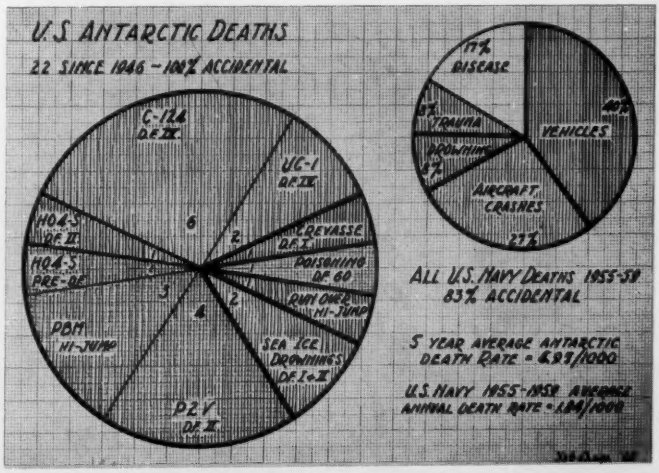

FIG. 2. U.S. Antarctic Deaths.

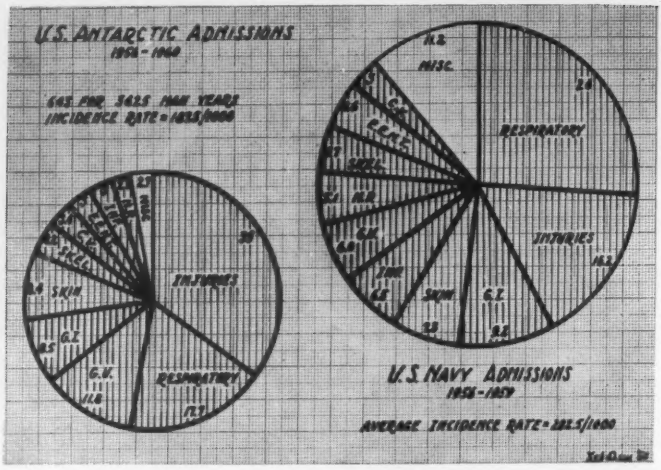

FIG. 3. U.S. Antarctic Admissions.

Although the five year average Antarctic death rate (4.97/1000) is almost three times that of the entire Navy (1.8/1000) during the same period, the rate for hospitalization is only two-thirds that of the Navy at large. In comparing these admission rates (Fig. 3) a number of interesting differences appear.

Injuries and genito-urinary admissions are twice as frequent, respiratory disease is only two-thirds as frequent, and infective and neuropsychiatric afflictions are only half as frequent in Antarctica as in the rest of the Navy.

In comparing the higher Antarctic admission rate for injuries (Fig. 4) with that of the Navy at large interesting differences appear. Wounds and head injuries are only half as frequent; abrasions and contusions three-fourths as frequent; burns twice as frequent; and amputations, avulsions, and multiple extreme injuries are four times as frequent in Antarctica. Needless to say freezing and frostbite injuries are twenty-

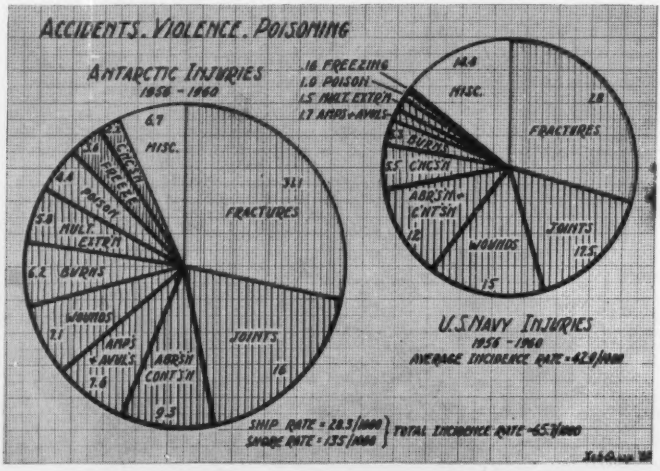

FIG. 4. Accidents, Violence, Poisoning—Antarctic.

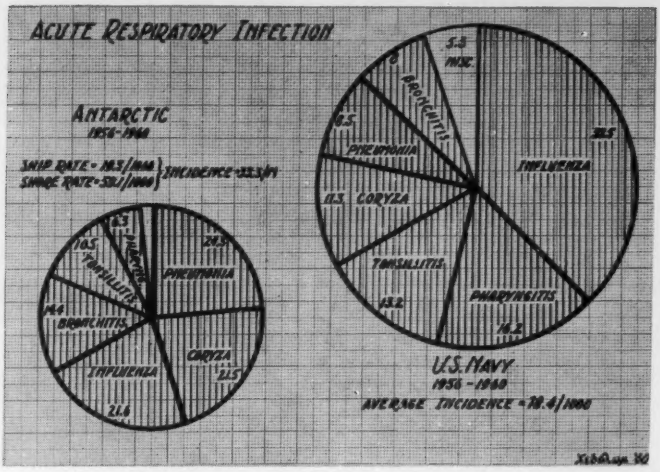

FIG. 5. Acute Respiratory Infection—Antarctic.

two times as frequent. This points out the violent nature of this land of ice, snow, and sudden death.

Nearly everyone is interested in polar upper respiratory infection. Fig. 5 shows that the Antarctic rate has been less than half that of the Navy at large. The Antarctic has had one-fifth the pharyngitis, and one-third the tonsillitis of the Navy at large. Coryza, bronchitis, and the pneumonias lumped show no significant differences in usual rate.

In 1955-56 and 1956-57 the Navy at large had much influenza in spite of mass preventive inoculation; we in the Antarctic had one-fourth of the Navy's influenza incidence rate in spite of *no* inoculations. When we began routine inoculations our incidence of upper respiratory infection seemed unaffected in Antarctica.

The term "influenza" is loosely used by many younger men to describe an acute, moderately febrile malaise producing upper respiratory infection with few other symptoms or physical findings. Almost invariably it is completely cured without sequellae or relapse with 36-48 hours of bed rest, forced fluids, and salicylates. This might far better be called "catarrhal fever" or just a "bad cold," particularly from the epidemiological, statistical, and inoculation points of view.

To dispel the theory that newcomers infect the previous wintering over party en masse and that the wintering over party loses its immunity to the common cold during its 7-11 months of isolation, detailed statistics were kept at McMurdo Sound, Antarctica during October 1959. Fig. 6 shows that the rate of acute upper respiratory infection of any and all types among the dwindling wintering over group was less than one-fourth that of the in-coming reliefs and summer "tourists" who brought infection with them or developed it on the ice. There was a small, but interesting flurry of infections among both groups beginning on the 10th day after first contact. Then there appears to be a minor secondary outbreak on the 20th day. It remains the author's opinion that because wintering groups are almost always completely free of *acute* upper respiratory infections during periods of isolation that they become immune to each other's "run of the mill" organisms, but they do not lose their immunity to other similar viruses during isolation. Occasionally virulent organisms in fur clothing, etc., have indisputably caused flurries of upper respiratory infection in isolated camps, but the same thing occurred to the author one sum-

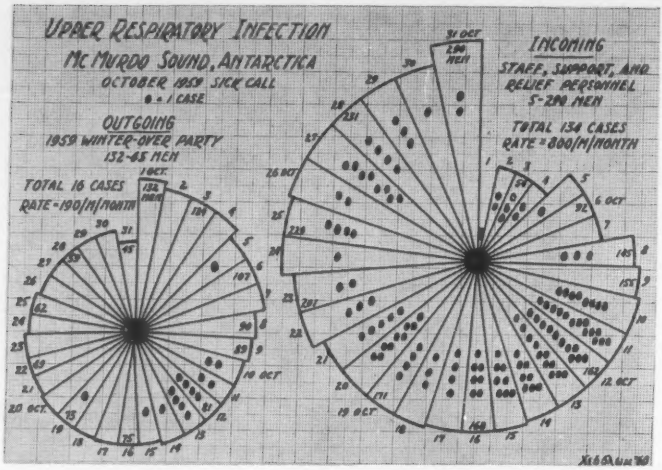

FIG. 6. Upper Respiratory Infection, McMurdo Sound, Antarctica.

mer in Washington, D.C., when his immunity had been extremely high for a number of years. Fatigue, irregular hours, overindulgence, and lack of supplementary vitamins probably play a more practical part in upper respiratory infection than do species of virus and/or their immune bodies. The higher rate among transients flying to and from the Antarctic as compared with personnel moving by ship seems to bear this out.

There have been very few infective diseases diagnosed in Antarctica, the rate being about one-fourth that of the Navy at large. Certain viral diseases seem to occur out of proportion there, namely, infectious mononucleosis which is two times as frequent, and herpes zoster which has been eight times as frequent as in the Navy at large. Seventy-four percent of Antarctic but only thirty-eight percent of Navy infective cases are of viral origin.

Are the men healthier aboard ship or ashore in Antarctica? On ships definitely, for shore admission rates are three times those aboard ship. Comparison of the admission rates shows interesting differences in morbidity. Men serving ashore or on the ice have seven times more neuropsychiatric difficulties (hazardous environment and isolation); six times more bone and muscle pathology (precarious footing and more hard physical work); and five times as many injuries (bundled up for the cold they are more clumsy, the cold is enervating and they work too hard and too fast to the point of fatigue and carelessness). On the ice men have four times the cardio-vascular difficulties (men on ships do not dehydrate and warm toilet seats are less conducive to factors producing hemorrhoids); three times more acute upper respiratory disease (the ship's better environment, food, and work hours, and more readily available fluids keep U.R.I. to a minimum); and double the skin ailments (ships are cleaner, men and clothing are cleaner, and rubber boots conducive to dermatophytosis are rarely worn aboard ship). For reasons unknown, those on the ice also have double the gastro-intestinal disease, infectious and parasitic disease, and E. E. N. T. disease of men living aboard ship.

Because the doctor's work load and efficiency as a physician are often measured by how he handles problems in sick call, and because the majority of medical supplies and equipment are used in office diagnosis and for ambulatory treatment, precise Antarctic sick call statistics were kept for the first five years of Operation DEEP FREEZE.

The following table points up a compari-

SICK CALL

	Visits	*% of total Visits*	*% Admitted*
Injuries	3088	28.7%	7.2%
Respiratory	2982	27.7%	3.8%
Dermatology	1511	14.1%	3.5%
Headache	801	7.5%	None
E. E. N. T.	608	5.6%	3.1%
Gastro-Intestinal	601	5.6%	9.1%
Bone, Muscle, and Joints	311	2.9%	8.7%
Insomnia	222	2.1%	None
Genito-urinary	144	1.3%	52.8%
Cardio-vascular	112	1.0%	19.6%
Benign Tumors	107	1.0%	9.3%
Neuropsychiatry	91	.9%	6.5%
Allergies	68	.6%	4.4%
Infectious & Parasitic	34	.3%	56.0%
Metabolic	10	.1%	10.0%
Miscellaneous	62	.6%	6.5%
Total Visits	10,752	100.0%	6.0%

ADMISSIONS

	Number	*% of total Admissions*
Injuries	225	35.0%
Respiratory	114	17.7%
Genito-urinary	76	11.8%
Gastro-intestinal	55	8.5%
Dermatology	53	8.4%
Bone, Muscle, and Joints	27	4.2%
Cardio-vascular	22	3.4%
E. E. N. T.	19	3.0%
Infectious & Parasitic	19	3.0%
Neuropsychiatry	15	2.3%
Benign Tumors	10	1.5%
Allergies	3	.5%
Metabolic	1	.1%
Miscellaneous	4	.6%
Total Admissions	643	100.0%

son between the numbers of men seen at sick call and those admitted.

Beside showing the relative proportions of injuries to admissions the above table shows infectious and parasitic diseases to be most often admitted. Second highest percentage of admission for number seen at sick call were genito-urinary complaints, however 88% of these admissions were for circumcision. Where, better than Antarctica, for such a belated procedure?

The relatively benign nature of the average upper respiratory infection is also well shown in this chart, for only eye, ear, nose, and throat complaints have a lower percentage admitted.

The prevalence of two SYMPTOMS, *headache* and *insomnia,* as leading causes for visits to sick call prompted a tabulation of the twenty leading sick call *complaints,* not categorized by specialty, but by frequency of occurrence. These are tabulated below in order of frequency.

This list of complaints focuses attention on material and training needs. A running nose is normal to hard work in the cold. It's NOT coryza.

Headache and insomnia are often better treated with practical psychiatry than with aspirin and barbiturates.

Sore throat (pharyngitis sicca) is dramatically relieved by combined ascorbic acid-nicotinic *acid* therapy.

Snowed-in back doors may lead to death in case of fire in a building with no escape.

Sulfonamides and antibiotics will never replace the steam heat in the treatment of the average bronchitis, nor will they replace

	Cases	*% of total complaints*
1. Running Nose	2023	18.0%
2. Wounds	880	8.2%
3. Headache	801	7.4%
4. Contusions & Abrasions	669	6.2%
5. Joint Pain	645	6.0%
6. Sore Throat	513	4.8%
7. Diarrhea	497	4.6%
8. Burns	350	3.3%
9. Skin Boil	326	3.1%
10. Athlete's Foot	315	2.9%
11. Earache	283	2.6%
12. Insomnia	222	2.1%
13. Frostbite	197	1.8%
14. Dermatitis	158	1.5%
15. Bronchitis	153	1.4%
16. Fractures	134	1.2%
17. Verrucae	130	1.2%
18. Sebaceous skin disorders	127	1.2%
19. Cellulitis	121	1.1%
20. Conjunctivitis	120	1.1%

the necessity for rest, heat, and elevation in expeditious treatment of local infection.

In summary the Antarctic physician must be a surgeon, internist, dermatologist, E. E. N. T. specialist, clinical pathologist, and occasionally a dentist. He must be versed in public health and camp sanitation. As a practical psychiatrist he must take interest in all the men and participate in all camp activities without dominating either. He must be enough of a historian to personally profit by his predecessors' mistakes, and to be able to teach cold weather hygiene, physiology, safety, and survival.

What does this combination of Osler, Mayo, Sutton, Jackson, and Toynbee do when, in isolation, he needs help? He has a shelf of medical books. Assistants? He trains them. Missing or broken equipment? He manufactures or improvises. Consultation? Only by radio. But, if the radio is dead?

Whether or not Santa Claus lives at the North Pole is a matter of conjecture, but we *DO* know Who lives at the South Pole. Don't be too proud to pray. If you have never met Him before, you'll meet Him in the Antarctic.

ORAL POLIO VACCINE

Dr. Albert B. Sabin, developer of live polio vaccine, recently visited in Japan and lectured to U. S. military and Japanese medical personnel on the subject of live polio vaccine.

U. S. Army Photo

(L TO R): MAJ. GEN. J. E. ENGLER, CG, U. S. ARMY JAPAN; DR. SABIN, COL. E. G. KING, MS, USA, SURGEON, U. S. ARMY JAPAN; COL. C. F. TESSMER, CO, USAMCJ MED. GEN. LAB.; AND COL. E. J. WITHERS, CHIEF OF STAFF, U. S. ARMY JAPAN.

Propulsion Chemistry and Rocket Launching Hazards*

Aspects of Rocket Chemistry of Interest to the Military Toxicologist

By

COMMANDER H. DAVID BALDRIDGE, JR., MSC, *U. S. Navy***

THE EMPLOYMENT of rocket propulsion as a means for delivering strategic and tactical payloads has in effect placed the military chemist and toxicologist in the front lines. Rocket motors are used in military equipment ranging from small anti-tank weapons such as the bazooka up to huge missiles and space probes. The motors of all presently operational rocket systems are heat engines of the chemical type involving the generation and ejection of large amounts of potentially toxic materials.

On the surface, there appears to be an endless race between the propulsion chemist in his choice of exotic materials and the toxicologist in his effort to protect personnel who must service and fire a rocket in the field. If there is, in fact, a race, then it is only fitting that the participants be properly introduced. Through such an introduction to some of the governing principles of propulsion chemistry, the toxicologist will not only see the reason for the race, but more importantly will know the direction wherein lies the finish line. It is the toxicologist who will benefit the most from such mutual understanding of purpose, for in this drive for more effective rocket systems the propulsion chemist will be setting the pace. An earlier paper[1] sought to show the relationship between propulsion physics and rocket launching hazards such as blast pressure, intense noise, high temperatures, and toxicity problems. The problems of propellant handling and toxicity also depend very heavily upon the basic principles of propulsion chemistry. In order to better understand this relationship and provide thereby a more enlightened approach to the solving of propellant toxicity problems, medical personnel should be aware of the fundamental requirements placed upon the rocket chemist and recognize the toxicological significance of the research objectives of rocket engine designers. The discussion to follow is intended to set the stage for such an understanding by developing in general terms the reasons behind the basic premise that the chemical reactions which occur in the chamber of a rocket motor are designed specifically to produce at highly elevated temperatures gaseous products with low molecular weights. With this design goal of the chemist in mind, the toxicological and handling problems of present propellants will be better understood and the nature of things to come will be more apparent.

PROPULSION CHEMISTRY AND ITS EFFECT UPON TOXICITY PROBLEMS

The fundamental principles of propulsion[2,3,4,5] require that in the operation of a chemical rocket a high mass rate of discharge of gases be maintained at a very high linear velocity with the least overall weight penalty. In order to meet this requirement, the rocket chemists and engineers make use of a host of toxic and corrosive chemicals which produce a variety of hazards to personnel who must handle them and/or be exposed to their reaction products. As shown in Figure 1, the thrust or propulsive force of a rocket motor is a direct function of the time rate of change of momentum of the exhaust gases; i.e., the propulsive force, F, is equal to the product of two rates; the rate, $\dot{m}$ or dm/dt, at which

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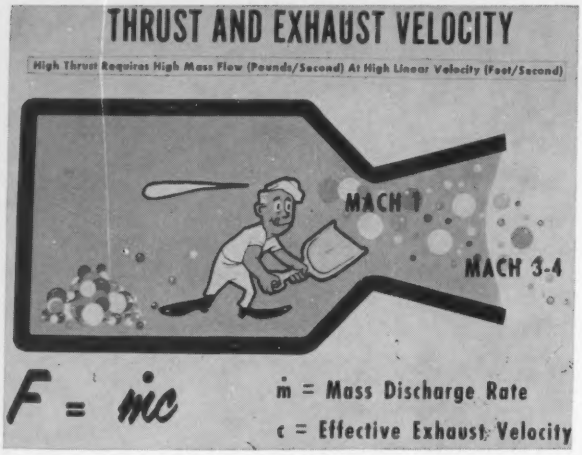
THRUST AND EXHAUST VELOCITY
High Thrust Requires High Mass Flow (Pounds/Second) At High Linear Velocity (Foot/Second)
MACH 1
MACH 3-4
F = mc
ṁ = Mass Discharge Rate
c = Effective Exhaust Velocity

FIG. 1. Relationship between rocket thrust and exhaust flow.

mass is ejected from the rocket per unit time and the effective linear velocity, c, of the exhausted material.

$$F = \dot{m}\, c$$

Because of the weight penalty involved in a high mass discharge rate, it would be better to maintain an elevated thrust level through a high linear flow of exhaust gases. The velocity of the rocket exhaust varies from that equal to the local speed of sound (Mach 1) at the throat of the nozzle to about 3-4 times the local speed of sound (Mach 3-4) as the gases leave the rocket after expansion in the diverging section of the nozzle. Thus, since exit linear velocity is limited to a small number multiple of local sonic velocity, the effective gas velocity and hence the thrust of a rocket are functions of the parameters which determine the local speed of sound in the exhaust gases. Let us take a look at these parameters in order to see their effect upon the direction of effort on the part of the rocket chemist and hence why propellant materials are restricted as to chemical composition.

Sonic velocity, V_s, in a gas is inversely proportional to the square root of the density, d, of the medium and directly proportional to the square roots of the pressure, p, and the ratio of specific heats, C_p/C_v or k.

$$V_s = (k\, p/d)^{1/2}$$

At any specified pressure, the density of a gas or mixture of gases is inversely proportional to the absolute temperature, T, and directly proportional to the molecular weight of the gas or average of the molecular weights, M, of the components of a gaseous mixture.

$$d \propto M/T \text{ , so}$$
$$V_s \propto (k\, p\, T/M)^{1/2}$$

The values for the ratio of specific heats, k, vary only over the limited range of about 1.2-1.4 and so are not as important as the other parameters. The pressure conditions are limited by engineering and structural factors associated with the fabrication of sufficiently strong motor cases and the pumping of liquid propellants. Thus, high sonic velocity in a rocket exhaust gas mixture, and hence maintenance of a desired thrust level with a minimum weight penalty, is heavily dependent upon the existence of a high temperature chemical reaction which leads to a mixture of gaseous products of low average molecular weight, i.e. a high value of the ratio T/M. This basic consideration has the direct effect as we will see later of limiting the concern of the toxicologist to propellant chemicals derived from less than a dozen specific elements and to a relatively simple set of rocket exhaust products.

High Reaction Temperatures and Low Molecular Weight Exhaust Gases

Temperature and molecular weight average are both functions of the amount of heat liberated in the chemical reaction occurring in the rocket chamber and are directly related to each other and to the chemical nature of potentially hazardous exhaust products. The temperature within the rocket chamber is elevated as a result of the release of energy in the reaction between the components of the propellant system. When temperatures are sufficiently elevated, molecules which are stable at room temperature lose their stability and are broken down or dissociated into more simple molecules, radicals, and/or atoms. This process of dissociation as a result of high temperature thus contributes to the desired effect of a lower molecular weight average in the exhaust gases. For example, water vapor (molecular weight -18) in the reaction products at temperatures of the order of 4500°F is largely dissociated into H and OH radicals (molecular weight average -9), and at temperatures above 7000°F further dissociation into monoatomic species H, H, and O (average molecular weight -6) takes place. Nitrogen dioxide (NO_2), the brown colored very toxic oxide of nitrogen, begins to dissociate into nitric oxide (NO) and oxygen at about 300°F with essentially complete conversion at about 1200°F. From 1600-5500°F further dissociation to elementary nitrogen and oxygen occurs. Advanced dissociation of all reaction products exists at temperatures above 8000°F. To the toxicologist this has the very significant meaning that no large complicated molecules can exist in the exhaust of a chemical rocket under full operating conditions.

This breakdown to simple species of low molecular weights is not without a price tag. This process requires energy and so limits that which is available for elevating the temperature, the other factor in the desired high ratio of T/M. As a result of such dissociation and also the restrictions resulting from structural engineering factors related to limited availability of heat resistant materials for motor fabrication, combustion chamber temperatures are limited to something below 8000°F in present practical chemical rocket engines. With this ceiling imposed by Nature on operating temperatures, primary efforts toward a high value of T/M must be in the direction of low molecular weight exhaust products, i.e., a low value of M.

Effect of Molecular Weight Restriction upon Propellant Composition

One way to make possible an exhaust of low average molecular weight is to use propellants, both fuel and oxidizer, whose molecules contain only elements of low atomic weights. This does not necessarily guarantee low molecular weights (some light elements form thermostable heavy polyatomic molecules with oxidizer elements), but at least it provides for the possiblity of light weight products. Therefore, propellant combinations, both liquid and solid, make use of a very restricted number of chemical elements, all with low atomic weights. The partial periodic table of Figure 2 shows these elements and their relationships to each other and illustrates the relatively limited area of concern for the toxicologist as a result of this restriction. Fuels consist of hydrogen either alone or in combination at a high percentage with light metals or metallike elements such as carbon, boron, beryllium, lithium, sodium, magnesium, aluminum, and nitrogen. Light metals are sometimes added to other fuels in the form of slurries or dispersions of finely divided powder. Most solid propellants of interest today contain up to about 25 per cent of elementary aluminum by weight. Even though a great potential gain in performance is possible through the use of beryllium metal powder in the same manner, the toxicity problems involved may limit or even prohibit such usage in large solid engines. Oxidizers are essentially restricted to molecules containing oxygen and the light halogens either alone or in combination with each other or with nitrogen. Sulfur is also present in the molecules of some types of solid propellants.

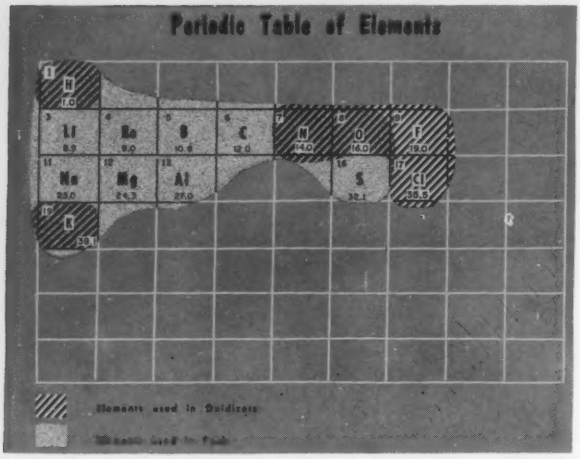

FIG. 2. Chemical Elements Used in Rocket Propellants.

There is, of course, a degree of overlap in that some of these elements appear in the molecules of both fuels and oxidizers; oxygen in the alcohol fuels, hydrogen in the nitric acid oxidizer.

The molecules of propellant chemicals are preferably simple combinations bound by relatively weak linkages with a minimum of intermolecular interaction. This is true since the energy required to break the linkages binding the atoms in the original molecules must be subtracted from the heats of formation of the reaction products in determining the overall heat produced by the reaction. Weak molecular bonds also give rise to instability and to high reactivity not only with respect to other propellant chemicals but also towards the molecules making up the skin, lungs, and eyes of missile workers.

By restricting propellant compositions to those containing elements of low atomic weight and the use of sufficiently elevated temperatures, the average molecular weights of present engine exhausts are all of the order of 20-30 grams per mole. Since the hydrogen and other very light elements are usually concentrated in the fuel, rockets are operated with a fuel-rich mixture in order to keep the molecular weight average down in the exhaust gases. This is an important point for the toxicologist to remember.

At the present time, research is in the direction of trying to reach in a practical engine the low molecular weight average of about 8-10 which is possible in the fuel-rich reactions between elementary hydrogen and oxidizers such as liquid oxygen and liquid fluorine. Along the path of this drive, all forms of chemical "handles" will appear on these three elements. Hydrogen has already been used in combination with carbon in the hydrocarbons (kerosene, JP, RP), with light metals in the form of hydrides (LiH), boranes (B_5H_{11}, $B_{10}H_{14}$), and borohydrides ($LiBH_4$), and with nitrogen in the form of ammonia (NH_3), various amines (aniline), and the hydrazines (unsymmetrical dimethyl hydrazine). Later engines will use liquid hydrogen and possibly monoatomic hydrogen. Oxygen appears in the form of liquid oxygen, in combination with hydrogen in hydrogen peroxide (H_2O_2), with nitrogen in nitric acid (HNO_3) and nitrogen tetroxide (N_2O_4), and with chlorine in the solid ammonium (NH_4ClO_4) and alkali metal perchlorate ($KClO_4$) oxidizers. Fluorine is just coming of age in operational rocketry and before use in the elementary form will appear in combination with nitrogen in nitrogen trifluoride (NF_3), and with other halogens either alone or with oxygen in oxidizers such as chlorine trifluoride (ClF_3) and perchloryl fluoride (ClO_3F). Many other chemical "handles" are possible, and each

adds its own contribution to the value of a particular combination as a propellant component. No propellant is ideal in the true sense. Final selection is made on the basis of compromise between a great number of thermochemical, engineering, and economic factors as well as operational requirements specified for the particular rocket engine in question.

Solid Versus Liquid Propellants

Even though the same physical parameters control the operation of solid and liquid rocket engines, there are some differences which are important to the Medical Department. It should be noted that solid propellants are not handled by men in the field in the manner of liquid propellants. Problems of vapor toxicity, corrosivity, and low temperature handling are peculiar to liquid propellant operations. The solid propellant is mixed and cast or otherwise fixed in the motor case at the factory. The motor is hermetically sealed (sometimes even pressurized with an inert gas), and the operating forces as a general rule never even see the propellant grain. Such motors have not been reported to evolve hazardous concentrations of vapors or gases, and the skin contact problem is non-existant. Early motors using nitroglycerine-nitrocellulose solid grains gave off sufficient nitroglycerine vapors to cause headaches among magazine personnel, but this has been remedied in later designs through more effective seals. Solid propellants, on the other hand, contain various additives for ballistic and manufacturing purposes, the presence of which affects the nature of the exhaust gases. The only significant effect is that resulting from small percentages of heavy metal additives such as lead and chromium. Thus, the toxicologist should make himself aware of the detailed composition of the particular solid propellant involved in a weapon system under evaluation.

The gap between solid and liquid propellant handling problems has been bridged to some extent in the use of pre-packaged liquid combinations where the fuel and oxidizer are contained and handled in sealed tanks with a minimum of liquid or vapor leakage.

Rocket Exhaust Gases

After exhaust gases leave the exit plane of the rocket nozzle, they become of minimal interest to the propulsion chemist and engineer, since these gases no longer contribute to the production of thrust. The toxicologist, on the other hand, is now faced with the problem of controlling the potential hazard presented by this "gas generator" to nearby personnel. Figure 3 shows typical compositions[2,3] of gases produced in the rocket reaction chamber. Presently operational rockets generate exhaust gases at a weight rate of up to about 800 pounds per second. At an average molecular weight of about 20 grams per mole, this amounts to something of the order of 16,000 cubic feet of gas per second. These rockets leave the launcher area at accelerations as low as about one-half that of gravity and under such conditions could dump into the launcher area up to about 50,000 cubic feet of exhaust gases. There are at least three important factors which should be noted by the toxicologist concerning these gases. First, the exhaust mixtures such as typified in Figure 3 are those of fully operating rocket motors. A rocket to be launched must pass from its initial motor-off condition up to that of full operation. Thus, in the initial phases of engine ignition and thrust build-up the temperature and pressure conditions in rising from ambient to operating values will permit for a short time the evolution of exotic chemical species which would not be stable under full operating conditions. For example, in the launching of a BOMARC (Figure 4) using a nitric acid oxidizer and an amine fuel, great amounts of brown nitrogen dioxide fumes appear during the initial launch phase but are not seen as the missile rises from the pad under full thrust. The extent to which the chemical products of this transition period will affect the toxicological picture will depend primarily upon the length of time involved. The effect is insignificant in the case of solid propellants since full operating cham-

Typical Rocket Exhaust Compositions

Volume Per Cent

LIQUID PROPELLANTS				SOLID PROPELLANTS			
Oxygen and Gasoline		Fluorine and Ammonia		Homogeneous Double-Base		Perchlorate Composite	
CO_2	10.5	HF	67.6	CO_2	23.6	CO_2	20
CO	37.7	N_2	4.1	CO	26.9	CO	22
H_2O	30.9	N_2	13.7	H_2O	27.8	H_2O	18.5
N_2	13.9	H	8.5	N_2	14.8	N_2	17
H	3.1	F	5.4	H_2	4.6	HCl	18
OH	2.9	N	0.7	O_2	0.1	H_2	2
O_2	0.4			O	0.1	Metal Oxides	2.5
O	0.4			NO	0.2		
				H	0.4		
				OH	1.5		
M Average							
21.8		18.7		27.5		29.7	

FIG. 3. Chemical Compositions of Typical Rocket Exhausts.

ber conditions are reached in only about one-tenth of a second. Liquid engines, on the other hand, gradually build up thrust over a considerably longer period of time, a matter of a second or two. In evaluating hazards involved during the launching of a liquid propellant rocket, the toxicologist or industrial hygienist must therefore include in his study air sampling and analysis to a far greater degree than that required in the case of solid propellants where exhaust compositions are more well defined.

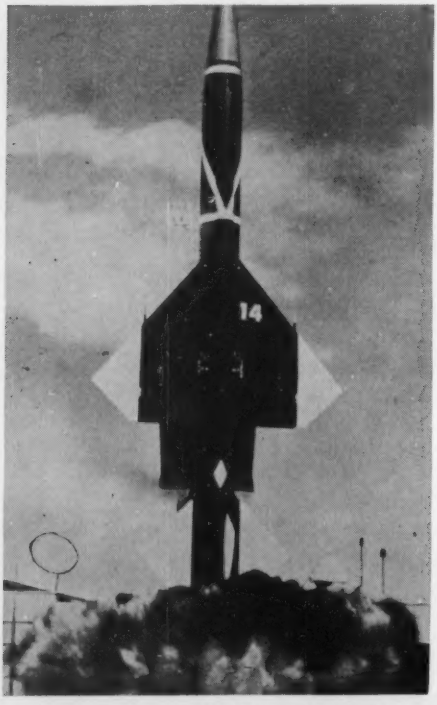

FIG. 4. Nitrogen Dioxide Gas Produced During a BOMARC Launching.

The second noteworthy factor has to do with the operation of the rocket motor under fuel-rich conditions. Under such conditions it is very unlikely that a significant amount of unreacted oxidizer material would escape from the fully operating rocket. As the hot fuel-rich high velocity gases leave the nozzle of the rocket, entrainment of surrounding air in the exhaust stream begins to take place. After sufficient atmospheric oxygen has been mixed with the hot gases, ignition of the stream occurs and the familiar exhaust flame is produced. This phenomenon is illustrated in Figure 5 which shows ignition of the exhaust of a TALOS some distance from the exit plane of the nozzle. This afterburning of exhaust gases greatly changes the picture for the toxicologist. As a result, fuel fragments and oxygen deficient species such as carbon monoxide and hydrogen are effectively converted in the flame to relatively innocuous oxidation products. In addition, the very active free radicals are provided with ample opportunity for further

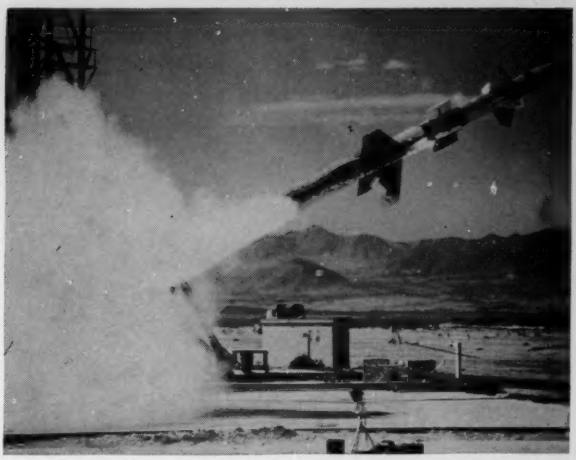

FIG. 5. Afterburning of TALOS Exhaust Gases.

reaction and/or oxidation. All this means that the toxicologist should keep in mind that from the nozzle to the end of the visible flame zone, the chemical nature of the exhaust mixture changes very rapidly. Afterburning leads from the somewhat exotic exhaust species typified by Figure 3 to the following relatively limited list of familiar materials.

Water
Carbon Dioxide
Nitrogen
Hydrogen Chlorine
Hydrogen Fluoride
Metal Oxides, Fluorides, and Chlorides
Sulfur Dioxide
Small Quantities of Unburned Carbon Monoxide and Hydrogen

Unburned exhaust gases are still of concern to medical personnel under conditions such as those existing aboard operating surface ships of the Navy. This is the situation where the opportunity exists for entrapment of booster gases before complete oxidation takes place. Such entrapment in confined unventilated shipboard spaces is a potential hazard to personnel who must man areas in the vicinity of a missile launcher.

The third factor to keep in mind is related to the spread and dilution of exhaust gases as a result of the velocity with which they leave the rocket. Since the exit velocity is something of the order of several thousands of miles per hour, considerable rapid deflection occurs when the exhaust stream impinges upon the launch pad or is turned in the flame bucket of a launcher. This deflection leads to considerable turbulence and mixing with large volumes of air and serves to dilute the exhaust gases very rapidly. Photographic data have indicated that during the launching of a missile such as a POLARIS from a flat pad (Figure 6) sufficient turbulence exists to lead to effective dilution of the exhaust products in a very short time. The volume of the exhaust cloud at about two seconds after firing is such that the average concentrations of the individual constituents are about 1/200 of the nozzle exit concentrations. At about ten seconds after firing, the exhaust cloud appears to have expanded about a thousand fold.

Under certain conditions, the high velocity of the exhaust stream can affect the hazard potential in a different manner. This has to do with penetration of seals around doors and hatches by exhaust gases and the subsequent entrapment of toxic substances in inhabited confined spaces such as shipboard compartments. A considerable difference exists in the penetration capability of the exhaust stream as a function of the velocity involved. When impinging gases move at

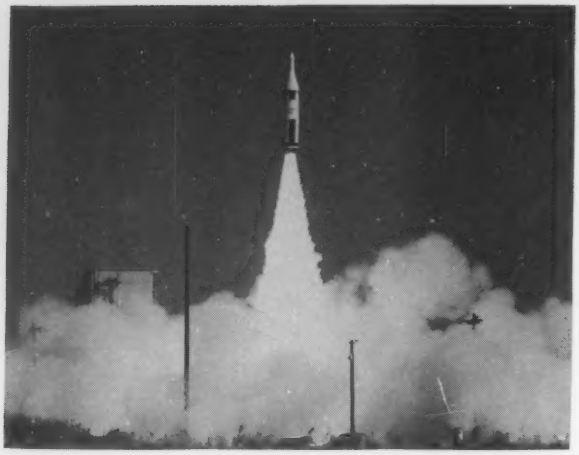

FIG. 6. Flat Pad Launching of a POLARIS Missile.

supersonic velocities, great care must be taken in designing and installing seals around possible ports of entry into spaces contiguous to the launchers aboard guided missile ships. The degree of effectiveness must be determined by air sampling during actual firing operations, since the variables are sufficiently numerous and flexible as to preclude a satisfactory extrapolation from ship to ship. Figure 7 shows the impingement and spread of exhaust gases produced during the launching of a POLARIS missile from a surface ship. Ignition of the rocket motor occurred about 70 feet above the deck after

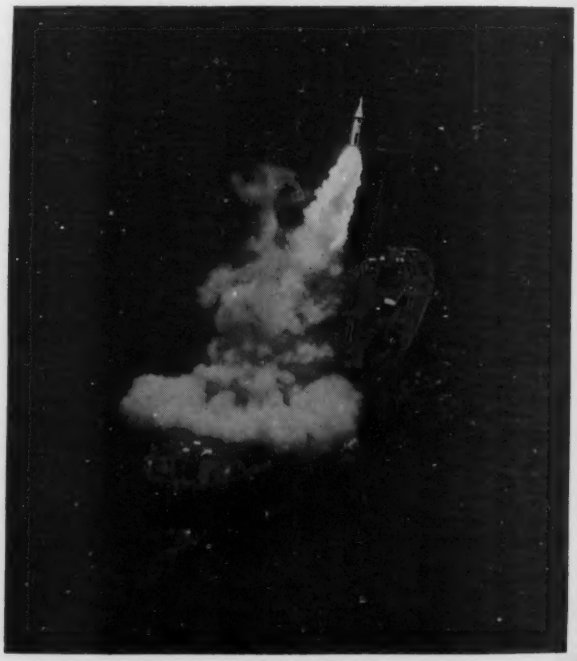

FIG. 7. Launching of a POLARIS Missile from a Surface Ship.

ejection of the missile from the launch tube by compressed air.

Summary and Conclusions

With an understanding of the restrictions placed upon the propellant chemist and the limited avenues which are open to him in the development of new rocket fuels and oxidizers, the military toxicologist and industrial hygienist will recognize that the race for more efficient chemical propellants is being run on a rather well defined track. The participants are limited to uncomplicated combinations of only about a dozen chemical elements which under high temperature reaction conditions and afterburning in the exhaust flame lead to relatively simple familiar materials with which medical personnel must cope.

Propellant materials are of necessity extremely active chemicals. High reactivity, unfortunately, usually goes hand in hand with high toxicity. The simple molecular combinations and low intermolecular interactivity in propellant molecules also give rise to significant vapor pressures and thus leads to high hazard potential in the case of most liquid propellants. We have in many cases low allowable concentrations coupled with vapor pressures which are fully capable of supporting vapor concentrations in excess of that considered hazardous. In the drive towards the use of elementary forms of low atomic weight elements, the problems of handling materials such as liquid hydrogen and liquid fluorine at extremely low temperatures will require a level of attention by medical personnel above that now given to such present day cryogenic materials as liquid oxygen.

The supply of "off the shelf" chemicals for consideration as fuels and oxidizers has been essentially exhausted, and the effort is now directed towards synthetic organic and inorganic chemistry. It is the objective of the chemical rocket researcher to develop propellant systems which will sustain the greatest thrust with the least weight penalty. It is the responsibility of the military chemist, toxicologist, and industrial hygienist to look over the shoulders of the researchers to insure that unreasonable additional penalties do not appear in the form of uncontrollable personnel hazards.

References

[1] Baldridge, H. D.: Propulsion Physics and Rocket Launching Hazards Mil. Med., 126: 169-181 (1961).

[2] Tormey, J. F.: Liquid Rocket Propellants—Is There an Energy Limit? Ind. Eng. Chem., 49: 1939 (1957).

[3] Wimpress, R. N.: *Internal Ballistics of Solid-Fuel Rockets.* McGraw-Hill Book Company, Inc., New York, 1950.

[4] Kit, B. and Evered, D. S.: *Rocket Propellant Handbook.* The Macmillan Company, New York, 1960.

[5] Warren, F. A.: *Rocket Propellants.* Reinhold Publishing Corporation, New York, 1958.

Scrub Typhus: Occurrence in United Nations' Personnel in Korea

By

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SCRUB typhus or tsutsugamushi disease has long been recognized as an endemic disease in most of Southeast Asia and adjacent islands. However, until 1951 only unconfirmed reports indicated that the disease might be found in Korea.[1] At that time Munro-Faure and colleagues described 2 cases of scrub typhus occurring in British Commonwealth Forces serving in Korea.[2] By the end of 1951, a total of 6 cases of this disease had been recognized in United Nations' personnel in Korea including 1 U.S.M.C. sergeant.[3] Thereafter, Jackson and co-workers demonstrated the presence of *Rickettsia tsutsugamushi* in 12 of 88 Korean rodents examined for this agent.[4] It therefore appears that this disease might continue to occur in U.N. personnel in Korea.

The purpose of this report is to present 2 additional cases of scrub typhus in whom the clinical diagnosis of this disease was made sufficiently early to permit treatment with chloramphenicol. In both instances, clinical diagnosis was confirmed by isolation of the etiologic agent, *R. tsutsugamushi*, from the patient.

CASE HISTORIES

CASE NO. 1: Clinical Data: This 22-year-old American Sergeant, a tank commander, was relieved from duty on the Main Line of Resistance (MLR) in central Korea on 15 September 1953 and was withdrawn to a replacement and training area about 10 miles north of the 38th Parallel. Because of his anticipated rotation to the United States within the succeeding 6 weeks, he was assigned to teaching and maintenance jobs within the replacement compound proper. The patient gave no history of leaving the compound until he became ill on 16 October.

His initial symptoms were limited to dizziness, but during the next 2 days he developed anorexia, occipital headaches, retro-orbital aches, and malaise, which became severe enough to make him seek medical attention on 18 October. He was subsequently transferred to the 48th Surgical Hospital (MA) on 19 October.

Physical examination on admission revealed a mildly ill patient with an oral temperature of 103.4°F., pulse rate of 110, and a blood pressure of 120/62 mm. Hg. There was a delicate pink maculo-papular rash on the patient's trunk. On the lateral aspect of the left antecubital space was a pink raised papule 1 cm. in diameter, at the apex of which was a tiny colorless vesicle. This lesion was interpreted as a furuncle. Mild conjuctival injection was present. Lymph nodes were palpable in the posterior cervical and left axillary regions. The nuchal muscles were slightly tender but no cervical rigidity could be detected. The remainder of the physical and laboratory examination was within normal limits.

On 23 October, the eighth day of disease, the patient's rash had begun to fade, and the lesion in the left antecubital fossa, previously thought to be a furuncle, had progressed to a black eschar 1 cm. in diameter. At this point the clinical diagnosis of scrub typhus was entertained and chemotherapy instituted.

The patient was given an oral loading dose of 3.0 gm. chloramphenicol followed

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by 3 oral doses of 1.0 gm. each at 8 hour intervals; a total dose of 6.0 gm. over 24 hours. A therapeutic response was noted within 12 hours after the first dose of antibiotic, manifested by a decline of the temperature, which reached normal levels on the 30th hour after onset of treatment. He subsequently had a low-grade afternoon fever, never higher than 100.8°F., for the next 5 days. After this period, he remained afebrile. Marked clinical improvement evidenced by alertness, increase in appetite, and desire for ambulation did not occur until the fourth day after initiation of therapy. Recovery was rapid thereafter, and he was discharged to duty on the 30th day after onset of disease.

Laboratory Data: The clinical diagnosis of scrub typhus was confirmed by isolation of *R. tsutsugamushi* from the patient's blood drawn immediately before chemotherapy was instituted on the eighth day of disease.The isolation procedure was similar to that described by Smadel and colleagues,[5] except that heparinized blood was employed rather than defibrinated blood.*

The results of Weil-Felix agglutination tests on this patient's sera are presented in Table 1. The serologic procedures employed were those of the Army Medical Service Graduate School, Washington, D.C.,[6] now Walter Reed Army Institute of Research.

The rise in titer of Weil-Felix OX-K agglutinins from negative at 1:40 to positive at 1:640 serum dilutions on the 19th day of disease is considered diagnostic evidence of scrub typhus infection. The titers of 1:80 observed with OX-19 and OX-2 antigens on the 19th day of disease are unusual. However, it may be pointed out that this patient had been immunized against epidemic typhus fever. The relation of this history to the atypical OX-19 and OX-2 responses is uncertain.

Case no. 2: Clinical Data: This 27-year-old Australian rifleman had been engaged in preparing his unit's battle position on the MLR in western Korea from 6 October 1953 until the evening of 3 November when he suddenly developed nausea, vomiting and malaise. On the following morning he complained of more nausea and vomiting, frontal headache, dizziness and fever. These symptoms persisted with increasing severity, forcing him to seek medical aid on 7 November. Because of persistent fever of about 104°F., he was evacuated to the 48th Surgical Hospital (MA) on 9 November. On the day of admission he developed retro-orbital aches and a maculo-papular rash.

Physical examination on admission revealed a mildly ill patient with an oral temperature of 99.6°F., pulse rate of 80, and a blood pressure of 134/76 mm. Hg. There was a generalized maculo-papular rash over the trunk, extremities, face and neck. Lymphadenopathy was present in left preauricular, both cervical and both axillary regions. An eschar was found on the mucocutaneous border of the left lower eyelid (Figure 1). Both eyes showed mild conjuc-

* Rickettsial isolation and serologic studies on Cases 1 and 2 were performed by members of the Field Unit of the Commission on Hemorrhagic Fever of the Armed Forces Epidemiologic Board and by the Virus and Rickettsial Departments of the 406th Medical General Laboratory and the Army Medical Service Graduate School.

Table 1

Weil-Felix agglutinin titers in case 1

Serum Obtained		*Titer of Serum Against Proteus Strain**		
Date	*Day of Disease*	*OX-K*	*OX-19*	*OX-2*
23 Oct 54	8	0	0	0
28 Oct 54	13	80	0	0
3 Nov 54	19	640	80	80
14 Nov 54	30	320	0	0

* Titers are expressed as the reciprocal of serum dilution; 0 indicates negative result at 1:40 serum dilution.

FIG. 1. Eschar on mucocutaneous border of the left lower eyelid of Case No. 2. (Photo by Lt. Ben T. Uyeno, MC, present address unavailable.)

tival infection. The remainder of the physical and laboratory examination was within normal limits. Following admission, the patient's temperature again rose to about 103°F., and his rash became more pronounced. On the basis of the history, rash and eschar, a clinical diagnosis of scrub typhus was made and chemotherapy begun on 10 November.

The patient was given an oral loading dose of 3.0 gm. chloramphenicol followed by 3 oral doses of 1.0 gm. each at 8 hour intervals, a total dose of 6.0 gm. over 24 hours.

The patient's temperature gradually returned to normal levels over 48 hours after beginning therapy. During the next 36 hours, however, his temperature rose slowly to about 102°F. and remained at that level until a second 6.0 gm. course of chloramphenicol was given on 17 November. Response to this course of treatment was prompt, with defervescence occurring within 18 hours after beginning therapy. His general clinical condition improved remarkably within 24 hours after initiation of the first course of chloramphenicol, and this improvment was maintained throughout the second febrile period. Recovery was rapid and complete after the second defervescence and he was discharged to duty 45 days after onset of illness.

Laboratory Data: Clinical diagnosis of scrub typhus was confirmed by isolation of *R. tsutsugamushi* from the patient's blood drawn immediately before each course of therapy. Sera obtained from this patient on the 10th, 14th, 17th and 21st days of disease contained no agglutinins against Weil-Felix OX-K, OX-19 or OX-2 antigens at serum dilutions of 1:40. Unfortunately, no later serum specimens from this patient were available for study. Further investigation of the rickettsial agent isolated from the patient has conclusively characterized it as a strain of *R. tsutsugamushi,* leaving no doubt concerning the etiology of this patient's illness.

DISCUSSION

Responses of both patients to treatment with chloramphenicol are atypical on the basis of previous experience with this disease in Malaya.[5,7] The persistent low-grade, afternoon fever observed in the first case for 5 days after antibiotic therapy and the actual recurrence of symptoms and fever in the second case were occurrences that were observed only on a few occasions in 94 Malayan scrub typhus patients treated with this antibiotic. Whether the responses described are typical of those to be expected in patients infected with Korean strains of scrub typhus will only be evident as more experience accumulates in that country.

SUMMARY

Two additional cases of scrub typhus have been reported from U.N. personnel in Korea. Both patients demonstrated beneficial, if somewhat tardy, responses to treatment with chloramphenicol.

Editor's Note: there are seven wax models made from scrub typhus cases in the Armed Forces Medical Museum, Washington, D.C. The series has Accession No. 266666. These show the eschar, the dermatitis, and conjunctivitis.

REFERENCES

[1] Smadel, J. E.: Scrub Typhus. In Rivers, T. M.: *Viral and Rickettsial Infections of Man.* 2nd edition. J. B. Lippincott Co., Philadelphia, Pa., 1952. pp. 638-651.

[2] Munro-Faure, A. D., Andrew, R., Missen, G. A. K., and Mackay-Dick, J.: Scrub Typhus in Korea. *J. Roy. Army Med. Corps* 97:227-229, Oct. 1951.

[3] 406th Medical General Laboratory: Annual Historical Report, Professional Section, 1951. pp. 13-14.

[4] Jackson, E. B., Danauskas, J. X., Smadel, J. E., Fuller, H. S., Coale, M. C., and Bozeman, F. M.: Occurrence of *Rickettsia tsutsugamushi* in Korean Rodents and Chiggers. *Am. J. Hyg.* 66:309-320, Nov. 1957.

[5] Smadel, J. E., Woodward, T. E., Ley, H. L., Jr., and Lewthwaite, R.: Chloramphenicol (Chloromycetin) in the Treatment of Tsutsugamushi Disease (Scrub Typhus). *J. Clin. Invest.* 28:1196-1215, Sept. 1949.

[6] Plotz, H.: The Rickettsiae. In Simmons, J. S., and Gentzkow, C. J.: *Laboratory Methods of the United States Army.* 5th edition. Lea & Febiger, Philadelphia, Pa., 1944. pp. 575-576.

[7] Bailey, C. A., and Ley, H. L., Jr.: The Treatment and Prophylaxis of Scrub Typhus with Antibiotics. *Ann. N.Y. Acad. Sci.* 55:983-991, Dec. 1952.

JET AMBULANCE

The Military Air Transport Service inaugurated its Jet Ambulance Service recently when it evacuated Army Paratrooper Sergeant William Johnson, Jr., from Germany to McGuire Air Force Base, New Jersey.

It is planned to make two flights from Europe each week. Each flight will carry approximately 50 patients and take about nine hours.

U. S. Air Force Photo

An Aid to the Psychiatrist in Military Forensic Medicine

By

COLONEL MARTIN B. GIFFEN, USAF, MC,* AND CAPTAIN HERBERT KRITZER, USAF, MC**

THE psychiatrist by reason of his training is the logical person to assist the law, under certain circumstances, in its administrations of justice. A psychiatrist should consider himself a professional advisor[1] and confine his observations and statements to the facts.[2] It has been our experience both personally and from teaching young service psychiatrists that it is at times difficult to function in this role. In many instances when a psychiatrist is requested to give an opinion as to the "sanity" of an individual who has allegedly committed a crime, he approaches the task with mixed feelings. Because of these feelings he may be subject to certain pitfalls thereby rendering himself less effective in the performance of these duties. Recognition of these pitfalls can be helpful in allowing the doctor to give a more objective evaluation and meaningful report.

While our discussion is centered around our military experiences it is felt that much of this also applies to civilian forensic psychiatry. The various factors that are felt to be significant, while admittedly there is overlapping, can be grouped under five categories for ease in presentation and understanding. These are: the doctor, the accused, the crime, the military, and the court.

THE DOCTOR

Much has been written on the importance of the doctor-patient relationship. There is no phase of clinical medicine where the interplay is entirely lacking. In some specialities this relationship assumes more importance than in others. In Psychiatry this interplay reaches its highest level and the subtleties of it must be understood if the patient is to benefit from treatment. The doctor is given the role of an empathic healer who by his skill and knowledge leads the patient to comfort and health. It is a very coveted role. If the role is felt to be jeopardized or altered, undoubtedly feelings of resentment arise and this can impair the ability of the doctor in his evaluation. The attempt to retain the more acceptable and time honored role may be seen in the manner the clinical reports are written. In a majority of the reports instead of the word "accused," with all it implies, the word "patient," is used throughout.

The clinical interview further intensifies the difference of the psychiatrist's role in the forensic evaluation. The doctor is required by law, before he starts the interview, to advise the accused of his rights. In the military he must advise the accused of the 31st Article (Manual for Courts-Martial). He must also notify the accused that privileged communication does not exist. During the period of observation and interviews much in the past life that is not complimentary to the individual may be brought forth. This material may, when presented, place the accused in a still less favorable light. The accused who may be more trustful of a physician than investigators, may reveal more acts of deviation. The doctor may well react to the undesirable connotations of "inquisitor."

The physician in view of this may overidentify with the accused. As a result, as Zilboorg has noted, many psychiatrists tend to favor letting a "patient" go free.[6] Because of this implied role the doctor may react with negative feeling. Frequently it is heard "a doctor should not get involved, the whole system is out-dated, my job is to

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treat the sick," etc. These feelings of resentment are also more prone to occur if the crime appears to be or is considered by the psychiatrist insignificant or of a minor nature.

The Accused

The personality of the accused while it represents the other pole of the doctor-patient relationship, can be very important in crystallizing the clinical picture and final diagnosis. The very passive-dependent personality arouses in many instances a need to protect. The individual who shows depressive features also raises within the physician a feeling that this individual is in need of help. On the other side of the coin the aggressive individual is more likely to raise feelings of resentment, of need to punish attitudes on the part of the physician. Even though the accused may carry his end of the interviews by being friendly and "open" with the doctor, his activity on the ward or with other psychiatric personnel may be of a non-cooperative nature. Here again the desire to punish may again cloud the findings.

With continued interviewing as the dynamics of the personality unfold, the mental mechanisms and thought content become clearer to the examiner, he may be prone to become permissive and forgiving. A concept appears to be in vogue that if the unconscious processes can be explained, the acting out can be forgiven. Somehow a dynamic viewpoint calls forth a permissive orientation which we feel has developed out of psychotherapy. It should be pointed out that all individuals have dynamics, be they normals, patients, or criminals.

To illustrate this aspect of over identification with the accused, the following case is abstracted: A 20 year old white male Navy enlisted man was transferred to the Psychiatric Service USAF Hospital Wiesbaden for further evaluation of his "sanity." He was charged with destruction of 5 aircraft. The charge of sabotage was being entertained by his Commander. The patient had previously been hospitalized at another Air Force psychiatric center. The diagnosis was Schizophrenic Reaction. In answering the required legal questions, the psychiatrist stated the patient was not responsible for his actions. The accompanying clinical records were well presented. The social history was detailed. The discussion of the dynamics clearly stated, observational notes on his behavior and activities were carefully noted. The "patient" verbalized marked concern about his masculinity, felt his mother was restrictive and domineering. He had a marked need to excel at everything. His parents noted from an early age that he was resentful of authority, very jealous of a younger sibling, and on occasions ran away from home. He joined the Navy at age 17. He disliked his present assignment. Nowhere was there any information to show any evidence of activities amounting to breaks with reality. From reading the chart such a diagnosis could never be substantiated. He did present clear and interesting dynamics. The evaluation at the Psychiatric Center Wiesbaden substantiated the dynamics but there was no evidence to support a psychotic state. This was the first forensic case the psychiatrist had evaluated.

The Crime

The type and "visciousness" of the crime is a factor that we feel is taken all too lightly in terms of its influence. An additional factor which may well color objectivity is the proximity of the crime to the doctor evaluating the accused. Crimes of violence or involving children as their objects stir tremendous social feeling. Crimes having less impact on the mores of society are more prone to cause less violent feelings or may even align the psychiatrist with the accused. In small communities such as most military bases, it is difficult at times to be objective with the vocalizations and feelings of the outraged group. Pressures both conscious and unconscious foment to rob the group of rational and intelligent behavior. Opinions run rampant and objective obser-

vations become less accurate. The psychiatrist as part of this group may be drawn into the group hostilities aroused by the breaking of the mores. Or he may in an effort to remain isolated from the outcry over-react in an opposite manner.

An airman, on separation from his wife, rented a hotel room. He picked up a girl and spent the night with her. The girl later indicated her age as 13. The accused was charged with unlawful carnal knowledge. The accused had previous difficulty with the military such as driving without a license and not conforming to laws of a host country. The patient was next to the youngest of 7. He was frequently beaten severely by an alcoholic father. No one seemed really interested in him. He had frequent trouble with the juvenile authorities. He failed in school 5 times. He was first married in 1950, but there were frequent separations and finally divorce in 1954. The accused remarried in 1957 to a woman who had two children out of wedlock. There was no evidence of psychosis. The patient frequently acted impulsively and would beat his hand against a wall when angry. Psychological testing showed an I.Q. of 84. Many psychiatrists testified concerning the responsibility of the accused. Those closer to the crime found him "not responsible" and unable to adhere to the right due to "mental deficiency." Those further from the crime found a "partial inability to adhere to the right." While the specific objective findings were exactly the same, such factors as proximity to the crime, the sexual act with a minor, the resultant local furor it caused were felt to be factors responsible for the differing opinions. In discussion of this case it was felt the psychiatrist who first evaluated the accused reacted to the local furor by over reacting, in an effort to remain "objective" he misinterpreted the abilities of the accused.

The Military

The military society has inherent in its structure factors which may give rise to resentment among physicians. The rigid rank-authoritarian system with limitation of freedom and need to accept orders without question is frequently at odds with the physician's training. In his medical and residency experience, a premium is placed on individuality of observation, judgment and responsibility. The physician may tend to identify with the accused who has "acted out against the system." The physician may vicariously express his feelings toward the system in this manner. He may react with excessive discipline towards the "patient" and set himself up as judge and jury, thereby appease his guilt. At the other end of the continuum he may accept the "raw deal" very readily and overlook his responsibility.[4]

Another reaction which can cloud the objectivity of the psychiatrist is in his relationship to "the line." Frequently commanders refer individuals with "problems" for which the commander cannot find a fast and satisfactory solution. The psychiatrist is put into the role of one who can solve all problems. One can see this readily in the referral of minor incidents where the matter could better be handled locally and more good accomplished. The psychiatrist in the military service could easily be "flattered" and accept this imposed role to the detriment of his objectivity.

The Court

Up to this point the doctor in relationship to the legal machinery it still apart and has the protection of medicine to allow him to evaluate the accused. He is on his own grounds so to sepak. If the psychiatrist is called to the court to give his findings, many emotional problems arise that could impair clear and objective testimony. Much as the "best of the pudding is in the eating" so the testimony at court is the high light of all the previous activity. It is the court that determines innocence or guilt, sanity or insanity. If the question of sanity or diminished responsibility is raised during the trial, only by clear and objective testimony can the court reach a satisfactory solution to the

problem that it faces. In the military service if a psychiatrist returns a finding that the individual could not distinguish right from wrong or adhere to the right for the acts charged, in almost all cases the charges are dropped. In this process then, with a finding of competency, the psychiatrist when called starts as a witness for the government and against the accused. He is no longer an impartial witness. There is one lawyer to "support" him and one lawyer who will attempt to tear down his testimony. From this develops a feeling of threat to the doctor's status and esteem. He is placed in a defensive position and may feel that he is asked to justify himself. This may show itself in court with unnecessary elaboration and wordage. He may attempt to show his medical acumen by the use of unfamiliar words, concepts, and theories to the court. He may confuse the court with unnecessary and oblique medical data. As the opposing lawyer starts his cross examination of the doctor's testimony the doctor feeling threatened, may start to compete with him rather than answer the questions.

It is felt that a recognition of the factors presented may aid the psychiatrist in forensic medicine. At our facility we have adopted the following to promote greater objectivity.

These include:

1. The use of group discussion in the evaluation of the accused.
2. Role-playing in preparing for court room testimony.

The testifying doctor takes "the stand" and his colleagues act as lawyers and ask medical-legal questions.

3. Review and study of transcripts of the medical testimony.
4. Promotion of increased relationships with lawyers with discussion of case material.
5. With marked emotional involvement, the recommendation that cases be sent to a more distant center.

Summary and Abstract

The special problems presented by the marriage of psychiatry and law in cases involving the "sanity" of an individual are considered under five aspects. These are: the doctor, the accused, the crime, the military, and the court. The *doctor* must be aware of his own dual role as physician and expert witness, and coordinate these two within his own personality. The individual personality of the accused can stir up feelings of antagonism or protection in the doctor, and these feelings must be guarded against. The type, viciousness, and proximity of the *crime* must be considered. The doctor must be aware of any feelings of resentment he might have toward the rigid rank-authoritarian *military*. And finally, the *court* itself points up differences in terminology and philosophy which must not be allowed to bog down the proceedings.

References

[1] Archer, B. C.: "Medical Culpability," *So. African Medical J.* 32 (15): 409-11, 12 Apr. 1958.

[2] Board, R. G.: "An Operational Concept of Criminal Responsibility" *Am. J. Psychiat.* 113: 332-36, Oct. 1956.

[3] Machay, Dick: J. "Views on the Use and Abuse of Psychiatry" *J. R. Army Med. Corps* 95:88-96, Aug. 1950.

[4] Sharman S.: "The Army Psychiatrist and Military Law", *J. R. Army Med. Corps,* 97:1-14, July 1951.

[5] Szasz, T. S.: "Some Observations on the Relationship Between Psychiatry and the Law", *Arch. Neurol. Psychiat.* 75:297-315, March 1956.

[6] Zilboorg, G.: "The Role of the Psychiatrist as an Expert Witness in Criminal Court", *Bull, N.Y. Acad. Med.* 32:196-201, Mar. 1956.

A Follow-Up Study of First Time Military Offenders

By

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THE ARMY defines ineffectiveness simply as the inability to perform satisfactorily as a soldier. Ineffective soldiers are a major problem for the military service. Aside from the fact that they do not perform adequately and represent a weak link in a commander's troops, these individuals usually take up the time of line officers, medical officers, legal officers and confinement officers to a degree which is far beyond what is commensurate with their numbers. Further, ineffectiveness results in a tremendous waste of funds that must be used for legal procedures, maintenance of confinement facilities and medical facilities. Ineffectiveness may manifest itself in a variety of ways, the major manifestations being physical illness, poor performance on the job and acting out behavior.

It has long been recognized that the Army is not able to act as the rehabilitation agency for society in general and that the best procedure for dealing with men who are ineffective to a point where their adjustment to the Army is impossible is to arrange for their separation from the Army under one of a number of existing regulations. Early recognition and processing of such soldiers is highly desirable since it is a way of saving both money and the valuable time of highly trained individuals; therefore, one major task of military psychiatry is to devise and implement means of early recognition and disposition of ineffective soldiers.

Since a major manifestation of ineffectiveness is acting out behavior of an antisocial type, military psychiatrists have shown considerable interest in the military offender and have sought screening methods to select out from the offender group those soldiers for whom separation from the service is the most satisfactory disposition. One such screening idea has been to examine soldiers who have received their first Court Martial. This is based on the hypotheses that this would both detect such individuals early in their military careers and that a group of individuals who have received a first Court Martial would yield a sufficient number of obviously ineffective soldiers to make such a program worth the expenditure of time that it would require. The purpose of the following research is to test out whether a first Court Martial Screening Program would be of any practical use for the Army and also to shed some light on the further problem of deciding which of the first offender group are candidates for early separation.

METHOD

By means of printed circulars and personal contact with commanding officers, a First Court Martial Screening Program was set up at Fort Sill, Oklahoma. Battery Commanders were asked to refer to Mental Hygiene Consultation Service soldiers who had received a first Court Martial. These men were interviewed by Mental Hygiene Consultation Service personnel and a history data sheet was designed to record in a systematic manner indications of past instability in the man being interviewed. A check-list type of data sheet was used in which 16 arbitrary indications of social, personal and familial instability were recorded. These included parental delinquency, parental alcoholism, parental divorce or separation, and parental psychiatric illness; whether or not the patient had finished high school, whether or not the patient had had previous psychiatric treatment, been an alcoholic, was in debt, had

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had indications of unusual traffic violations, was himself separated or divorced, or had had a police record. In addition, factors of instability during the man's service career, such as frequent sick call, previous nonjudicial punishment, and poor motivation and attitude toward the service were recorded. Individuals taking the histories were given a mimeographed guide for filling out the data sheet. The data sheet guide was used to insure relative consistency in the criteria for filling out the data sheet. After completion of the screening interview, the patients were sent back to duty.

Sixty-four such soldiers were processed in the study. Six months following the initial screening evaluation a follow-up study was done to determine the subsequent performance in the military service of these subjects. The follow-up form yielded information as to whether or not the man had received an administrative discharge, and also yielded information as to current efficiency and character rating, current rank, and general adjustment and effectiveness.

The study was designed to answer two questions: (1) whether or not a group of soldiers who had received one Court Martial differed in their subsequent adjustment in the Army from the general population of soldiers, and (2) whether or not any specific factor or combination of factors of psychiatric history distinguished those in the research group who had made subsequent good adjustments, as compared to those who had made subsequent unsatisfactory adjustments to the Army.

Data and Results

1. Data as to subsequent military adjustment of the research group.

Of the 64 follow-up letters sent out, adequate data in regard to subsequent military adjustment was returned in 60 subjects. Because of an unavoidable loss of records, the individual history data sheets which had been filled out at the time of the initial evaluation were available in only 37 of the subjects.

Of the 60 soldiers studied, 14 (23%) had received discharges from the service for unsuitability or undesirability. This group will later be referred to as the Unsatisfactory Adjustment Group. An additional 9 soldiers (15%) were either awaiting Court Martial, were awaiting general discharge or had made obviously poor adjustment to military life as based on specific comments to that affect by their commanding officers. This group will later be referred to as the Borderline Adjustment Group. The remaining 37 soldiers had made what appeared to be satisfactory to excellent adjustment to military life. This group will later be referred to as the Satisfactory Adjustment Group.

2. Data as to specific historical factors.

As indicated above, the subjects were, on the basis of their subsequent behavior, divided into three groups, those showing an unsatisfactory adjustment, those showing borderline adjustment and those showing a satisfactory adjustment. Because of the small number of subjects on whom historical data sheets were available, when the subjects were broken down into the subgroups, the N's were too small for statistical anaylsis. However, certain definite trends are apparent and deserve mentioning. If the number of positive indicators of previous instability were counted up it was found that there was a difference in the means for the three groups. The Unsatisfactory Adjustment Group had a mean of 4.8 instability items in their histories, the Borderline Adjustment Group had a mean of 3.4 instability items and the Satisfactory Adjustment Group had a mean of 2.2.

When specific items of instability in the history of the subjects were tallied and examined, no specific item or group of items appeared to differentiate the groups. There was approximately equal proportion of individuals not completing high school in all three groups; as to other specific items there appeared to be a complete meaningless scatter. The only possible difference in specific items was in whether or not the

subject had specifically verbalized a desire to remain in the service. On this item there was a slightly higher proportion of positive motivation in the Satisfactory Adjustment Group, but again the N's were so small that a test of significance could not be meaningfully applied.

Discussion

Twenty-three percent of the subjects were discharged for ineffectiveness. Another 15% had made borderline adjustments. Combining these two percentages reveals that 38% of a group of soldiers who had received a single Court Martial were performing ineffectively as soldiers. Although no control group was used in this study, it is reasonable to compare the 23% figure with the Army-wide administrative discharge rate which in 1959 was 21 per 1,000 average troop strength per year.[1] These two figures reveal an obvious disparity.* A further comparison can be made with the rate of general discharge in the Navy of 3.7%, as reported in a study by Flag.[2] These data would tend to support the idea that a First Court Martial Screening Program is a meaningful method of early detection of ineffectiveness in the Army.

The data as to significant historical material must be questioned because of insufficiency of numbers but does tend to bear out the general clinical impression of individuals working in military psychiatric settings that the best criterion for determining whether or not administrative discharge is indicated would be multiple previous indications of instability. The data further suggest that great caution should be used in using any one or several specific factors of background in reaching a decision as to whether administrative discharge should be recommended.

* These figures are, strictly speaking, not comparable since one is a percentage and the other is a rate per thousand troop strength per year. However, it is obvious from inspection that the figures represent a significant difference.

Summary

A study of 64 first time military offenders was done to determine the value of a First Court Martial Screening Program for early detection of ineffectiveness in soldiers and also to determine possible ways of predicting subsequent success in the military service within a group of first time offenders. The data indicate that there is a significantly higher percentage of administrative discharges in a group of first time offenders as compared to the general Army population and suggests that a First Court Martial Screening Program is one valuable method of early detection of ineffective soldiers. The data further suggests that a past history of multiple indications of instability is probably a good criterion for prediction, but that specific historical items are of doubtful value in making such predictions.

References

[1] Glass, A. J., Artiss, K. L., Gibbs, J. J., Sweeney, V. C.: The Current Status of Army Psychiatry. American Journal of Psychiatry, 117, 673-683 (1961).

[2] Flag, John A.: Some Considerations of the Value of the Psychiatric Screening Interview. Journal of Clinical Psychology, XVII, 3-8 (1961).

How to Lose an Audience

By

LIEUTENANT COLONEL GEORGE ZINNEMANN, USAF, MSC*

HAVE you ever lost an audience?

Many officers of the Armed Forces Medical Services have frequent opportunities or requirements to report on their research activities, on their organization's achievements or modus operandi, or on related subjects. Their audiences may be large or small, lay or professional, military or civilian.

While attempting to put his best foot forward, the speaker may, out of the corner of his eye, note the following goings-on in his audience:

heads are slowly descending towards the owners' chests, occasionally returning to the vertical position with a jerk or possibly remaining down until the end of the speech is indicated by scattered and perfunctory applause;

some wide-awake listeners stare politely at the speaker, but their facial expressions leave some doubt as to their concern with the subject under discussion;

an occasional pair of members of the audience carry on a private conversation in stage whispers; and

horror of horrors, a few saturated listeners actually get up and, after tripping over several sets of legs belonging to their sleeping colleagues, reach the center aisle and leave the auditorium, envied by some who lack the nerve to do likewise.

If you, as a speaker, have experienced this sort of thing, I daresay your first reaction was a mixture of frustration, anger, disappointment, and the determination never to let yourself be talked into speech making again.

After drowning your sorrows in a martini or two, you may wish to reevaluate the fiasco with some objectivity. Did your audience consist of a rare assortment of boors, ignoramuses and ill-bred monsters who obviously used the attendance at your lecture as an excuse to get away from work or an unpleasant domestic situation?

Let's face it: assuming that the subject of your lecture was an interesting and worthwhile one, which is the sine qua non of addressing your public in the first place, the responsibility for your audience's seemingly uncivilized behavior was YOURS. You, my friend, were the one who abused its benevolence; taxed its patience; did violence to one or more of its collective senses; and frankly, committed the unpardonable sin of being a crashing bore up there on your platform. As a matter of fact, you got off easy. With a few ripe tomatoes on hand, who could tell. . . !

If none of your speech-making efforts have ever been rewarded with one or more of the audience reactions described above, let me be the first to congratulate you and please don't bother reading any further.

If you have ever felt yourself to be on the receiving end of audience indifference or antagonism—welcome to the club. Let's see if we can figure out how you managed to get yourself into this mess.

REASONS FOR SPEECH MAKING

Why are you making a presentation? Maybe someone volunteered you, or you felt this was an opportunity to get a free trip to a city you have always wanted to visit. However, your audience has a right to expect better reasons and motivation. Not the worst is the desire to bring credit for your work upon yourself, your organization, and, in the case of an international audience, your country.

Let us assume that you are presenting a paper dealing with research efforts made

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by you as an individual or by your group. Here are a few good reasons for doing it:

You have a new, original idea dealing with a problem area or a specific problem. Make certain that it is in fact new and original. There is at least one man in every audience who will take delight in quoting by chapter and verse the publication of the same idea back in 1873.

You have put someone else's idea to the test and found that it doesn't work. Unless you merely wish to demolish a time-honored misconception for the benefit of humanity at large, it might be wise to advance your own improvement on the idea with which you take issue.

You have completed a major research project and wish to present the end product to the world.

You are engaged in a project of proven merit and have hit a major obstacle. Discussion and correspondence subsequent to your presentation may result in a solution.

Your work has resulted in unexpected, inexplicable and significant results. The scientific community may be able to benefit from these results in one or several unexpected ways.

These are examples of good reasons for making a speech. If they, or equally valid ones, don't apply to your case, stay home!

How to Lose an Audience's Attention

Having convinced yourself that the reason for making your presentation satisfies one or more valid criteria, your next logical step is to decide on the most effective way of getting the information across to your audience.

An excellent way to defeat your purpose of keeping your listeners interested is to write your paper in a format suitable for publication in a technical journal and then to READ it from the platform. This is the best means for robbing your effort of any spontaneity and enthusiasm which could possibly communicate itself to your audience.

There are probably several reasons for this type of failure. First of all, you are slightly nervous, whether you want to admit it to yourself or not, and you may become so engrossed in the task of reading per se, that the subject of your lecture becomes unimportant to the listeners simultaneously.

Next, the word-for-word reading brings with it a danger of lapsing into a glib, hurried monotone which is likely to set listeners' minds wandering, especially just before lunch or at the end of a long day's sitting and listening.

Finally, there may be a subconscious resentment generated by the fact that each member of your audience is perfectly able to read himself and doesn't necessarily appreciate your doing this for him. He would just as soon have your talk in written form and read it at a speed of his own choice.

You are sure to find that you will have far greater empathy with your listeners if you are able to look at them while addressing them. Even if you have to grope for an occasional elusive adjective by speaking without a manuscript, you will be way ahead in the game of keeping the audience with you.

If you feel yourself unable to think on your feet and fear that you might mix up the logical sequence of your presentation or leave out some important points, by all means use a small card or paper which reflects the general organization of your talk. An occasional glance at this cue card will immediately bring you back on the right track.

Time Limits

To make yourself truly unpopular with your audience, your fellow speakers, your session chairman, and the world at large, disregard the time limit which has been imposed upon your presentation. Few infractions of speaking etiquette engender as much animosity as ignoring the clock, and for good reason.

You have no doubt come across the speaker so enamored with the sound of his

own voice that he seems unable to shut up and sit down in spite of frantic arm waving by the session chairman and noticeable restlessness in the audience. The results of such thoughtless behavior are easy to see: by usurping more than his rightful share of available time, the speaker forces his successor or successors to shorten a well-planned presentation or to race through it with attendant loss of effectiveness. In extreme cases entire presentations have had to be dropped from the program. Least deserving of sympathy is the speaker afflicted with logorrhea who rambles on into the lunch hour or causes his listeners to be late for the cocktail party scheduled after the last paper.

The matter of timing a presentation deserves careful consideration. If you can't scrape up an audience for a dry-run, try your talk on your wife. If she is no expert on the subject matter, so much the better. She can serve as a useful equivalent for those of your eventual listeners who have only a marginal interest in your paper.

Basic Considerations

Now for the mechanics of speaking to your audience. While you may never have taken a course in public speaking a little practice will help you to avoid some of the pitfalls of your platform performance.

Don't whisper—the effort of straining to hear your voice in addition to digesting the information you dispense is overwhelming and will be shortly abandoned by those not blessed with acute hearing.

A familiar figure on the speaker's platform is he who starts each sentence at an acceptable sound level and with clear enunciation, but trails off into an all but inaudible mumble and swallows the last few syllables entirely. The audience just doesn't have the capacity to reconstruct what those missing words were likely to have been.

If you use a fixed microphone, speak directly into it and don't turn your back on it while pointing at a slide. Throat or lapel mikes don't normally present this hazard, but it is well in any case to inquire whether everyone in the audience can hear you clearly.

Aiming Material at the Entire Audience

While the group you are addressing can be expected to be reasonably homogeneous, it may be well to bear in mind that there are likely to be great differences in the individual members' background, interest, and specialization. Few of them can be expected to be familiar with higher mathematics, and you will quickly lose all the others if you demonstrate at length the mathematical acrobatics by which you have arrived at the solution to your problem.

Many are unfamiliar with the particular jargon which evolves in any narrow area of specialization, and it just won't do to employ nicknames, abreviations, or code words which are commonly bandied about back at the shop. Even if you have to pronounce the same four-dollar word over and over again, this is preferable to swamping the audience with a welter of mysterious (to them) letters and expressions. Don't presuppose a comprehensive familiarity with your special field of interest on the part of your listeners.

If, in spite of heeding some of the sage advice given in the foregoing paragraphs, you feel yourself slipping and the audience getting away from you, DO SOMETHING—stand on your head if necessary. Many excellent technical presentations suffer from being delivered in a dry, learned, pokerfaced manner. A little levity is not only permissible, but desirable. A laugh here and there stimulates the audience—also, it wakes an occasional sleeper who will try to stay awake until the next joke. Keep your cracks at a polite level though—dirty jokes are usually embarrassing to a mixed audience, especially a sober one.

Organization

Enough about the "why" and "how" of making a presentation. Unquestionably the

most important part is the "what," the contents of your speech, and its organization.

The subject matter is of course entirely up to you and may be anything you feel qualified to talk about, be it the construction of a superior martini or the sex life of the amoeba.

The organization of your talk, the breakdown into its essential elements, is so obvious that it is brought up for the record only.

State the problem (if there is no problem, introduce the subject).

Outline your approach toward a solution (or, give a reason for your making a speech).

Explain limitations and difficulties encountered.

Present results in clear English—skip nonessential details.

Draw conclusions.

The conclusion, being something of an end product, merits a good deal of thought. It need not be an answer or solution to the problem. It could be:

an admission of failure and suggestion for additional work

a summary of progress

a request for suggestions as to alternate approaches.

No matter what the conclusion is or what form it takes it is yours to be stated firmly. It is the crowning glory of your labors, and you are expected to back it up against all nasty comments from the floor.

This would appear to be a logical point at which to stop dispensing free advice. However, there is one more matter to be brought up which, by leaving it until the end, will—I hope—make a more lasting impression. It is truly deserving of this honor, because its misuse has wrecked many an otherwise excellent presentation.

I am referring to those precious adjuncts of a public speech: visual aids, better known as motion pictures and slides.

Visual Aids

Few indeed are the fortunate ones who can command their listeners' interest by relying on their speaking ability alone, excluding the use of any illustrative materials. For the purpose of this discussion we can safely disregard that small, select group—particularly since they will have stopped reading this article somewhere around the second paragraph.

Generally speaking, almost any lecture can be made more effective by judicious use of visual aids. This does not mean that a poor presentation can be salvaged by using good movies or slides as a crutch, nor that visual aids by themselves constitute an acceptable substitute. In extreme cases, their quality can make or break the presentation—but they are limited to their role of adjuncts.

Motion Pictures

Motion pictures can be used to supplement a lecture most effectively, if they are appropriate to the subject and meet accepted standards of photographic and editing techniques. If they are prepared at lower than professional level, you will do yourself a favor by eliminating all underexposed, overexposed, blurred and otherwise unsatisfactory scenes which may cause visual discomfort to your audience. Be ruthless in abbreviating scenes where length contributes nothing.

Don't let the film crowd you off the podium. Unless your function is merely to introduce a self-contained feature production with music and sound effects, it is better to use a silent film and supply live narration. This relegates the film to its proper function of being a lecture aid, rather than the star attraction.

Lantern Slides

The most commonly used—and abused—visual aid is the lantern slide. It is used to the benefit, and frequently the detriment, of the large majority of all technical presentations today.

A well-prepared slide correctly used will focus rather than divert attention. To do this, it must present one central idea, with maximum clarity and simplicity.

You may have been exposed to the

speaker who says "As you can see from the next slide . . .," then shows a jumbled mess of figures, curves, or symbols which are barely legible from beyond the third row of seats. I have observed two reactions to this situation. If the room is partially lighted, people will start studying the financial page of the daily paper. If it is dark, the cat nappers go into action.

This speaker has violated two basic rules of slidesmanship: simplicity and legibility.

An illustration or figure for publication in a technical journal is frequently unsuitable for use as a lecture aid. Illustrations in articles are usually complete in themselves and often quite detailed—they can be studied at the reader's leisure. Also, a complicated chart in an article normally contains several ideas which, when presented in one slide, tend to distract the attention of the audience.

Many slides show an over-abundance of curves, grid rulings, and words. The common result is a reduction in the size of the lettering to the point where only a favored few in the audience are able to decipher it.

Byrnes[1] has determined the following sizes of projected letter images to be suitable for indicated room lengths:

Room Length	*Letter Size*
25 ft.	23 mm.
50 ft.	45 mm.
75 ft.	68 mm.
100 ft.	90 mm.
125 ft.	113 mm.
150 ft.	135 mm.
175 ft.	158 mm.
200 ft.	180 mm.

The above optimum letter sizes will permit a viewer in the back row, possessing a visual acuity of 20/40, to read them without effort.

I do not propose to include a complete set of DO's and DON'T's for the preparation of slides, nor to go into the great variety of illustrations (e.g., bar diagram, pie diagram, pictogram, line graph, etc.) which can effectively be used. I would however refer you to several excellent articles on the subject by Brigadier General Victor A. Byrnes, USAF, MC (Ret.),[1,2,3] which are recommended reading for all speakers who plan on using visual aids.

Slides—Aid or Obstacle?

Permit me to bring this discussion to an end with a few pet notions of mine on the subject of lantern slides.

How many times have you heard a speaker call for the "First slide, please," and then see him shaken up by getting the last slide, or one out of the middle? Or to have the slide appear upside down or in a mirror image? The time necessary to correct these blunders disrupts the continuity of the lecture, annoys the speaker and the audience, and generally destroys all advantages of good showmanship.

How to avoid this? Be sure each slide has a "thumb spot," a piece of tape so located on one corner that the projectionist's right thumb is on it when inserting it correctly into the projector. The sequence number can be written on the thumb spot.

Another pet peeve: the speaker who asks the projectionist to bring back a slide shown previously, often after several other slides have intervened. Nine times out of ten, the wrong slide appears. The projectionist gets flustered and becomes the victim of a totally undeserved inferiority complex.

The remedy: say everything that needs to be said about any one slide when it is shown the first time, and spare us your afterthoughts. If an early slide must be shown again for comparison purposes, have a duplicate made and integrate it at the proper place in your slide sequence.

Finally, I should like to relate a somewhat unorthodox method used by one speaker to boost his audience's attention. He had reason to suspect that his captive audience (a class of student flight surgeons) was not exactly consumed with a burning interest in his subject, which happened to be dermatology. To make matters worse, his lecture was scheduled right after lunch on a hot day.

He interspersed his slides with two or

three down-to-earth "cheesecake" pictures at strategic moments, making a great show of apologizing to his delighted listeners for having gotten his slides "mixed up." After the first of these "mistakes," every last man in the audience was wide awake and stayed that way until the end.

This sort of thing can of course be overdone and is not necessarily recommended, but it is just an example of how visual aids can be used to stimulate an audience.

Conclusion

It is hoped that the foregoing discussion may have served to identify a few sources of audience dissatisfaction, and that the readers, if any, will have absorbed a few ideas for later use in making effective presentations.

Now if you will just excuse me, I am about to attend a lecture in our auditorium down the hall. I've heard the speaker before. A thirty-minute nap will do me good.

References

[1] Byrnes, V. A.: "Illustrations for Ophthalmic Articles and Lectures." *Am. J. Ophth.*, 34:1719, 1951.

[2] Byrnes, V. A.: "Illustrative Lantern Slides to be Shown at Professional Medical Society Meetings." *Supplement to the Transactions of the American Academy of Ophthalmology and Otolaryngology*, Jan.-Feb., 1951.

[3] Byrnes, V. A.: "Adjuncts in Teaching Ophthalmology," Course No. 214, 1953 Instruction Section, American Academy of Ophthalmology and Otolaryngology.

[4] Hawkins, W. M.: "Your Audience Has High Hopes," published by Institute of the Aeronautical Sciences.

[5] Fischer, H. S., and Bliss, R. L.: "Slide Memoranda," published by the Los Angeles Section, Institute of the Aeronautical Sciences, 1951.

KIMBROUGH U. S. ARMY HOSPITAL

The Kimbrough Army Hospital at Fort George G. Meade, Maryland, recently dedicated, was named in honor of the late Colonel James C. Kimbrough, Medical Corps, U. S. Army, an internationally known urologist.

The Commanding Officer of this 125-bed hospital is Colonel Claude C. Dodson, MC, USA.

Clinical Evaluation of a Vasoconstrictor—An Agent for Relief of Nasal Congestion*

By

LIEUTENANT COLONEL A. D. HAVERKAMP, MC, U. S. Army

INFLAMMATION involving the nose, sinuses, or middle ear is usually mild, self-limiting and of short duration. In general, symptomatic treatment and conservative supportive measures are all that may be required to relieve the patient's discomfort. Among these general measures, local vasoconstrictors have proven very useful since they rapidly improve ventilation, promote drainage and relieve pressure within the sinuses. However, nose drops are many times not recommended during the early phases with serum discharge, a time when obstruction is not important.

Many acute sinus and ear infections are initiated by viral attacks (common cold, etc.) which ordinarily do not respond to antibiotics. However, *true* infections of the sinuses, caused by bacterial invasion and accompanied by inflammation, necessitate adequate chemotherapy in addition to supportive measures. The spread of infection is a result of the secondary bacterial invaders over and above the viral attack. Although antibiotics are of little value in the early stages, they become urgently necessary later on, when infection has set in.

Numerous studies have been reported on the clinical effectiveness of vasoconstrictors alone, and in combination with steroids and antibiotics in the treatment of acute and chronic rhinitis and/or its complications. It is our opinion that local application of a specific vasoconstrictor is one of the most important steps in treating these conditions. Despite the great strides made by the pharmaceutical industry in supplying the profession with a vast array of vasoconstrictors for intranasal or oral use, most of them have been found wanting in one way or another. Many of these vasoconstrictors are not rapidly effective or produce undesirable side reactions of either a local (irritation, cilia damage, etc.) or a systemic (blood pressure changes, habit formation, nervousness, sleeplessness, etc.) nature. Other compounds, although well tolerated prove evanescent in effect and provide only temporary or brief relief. Still other vasoconstrictors lead to the development of rhinitis medicamentosa with persistent nasal stuffiness and possible permanent degenerative damage to the nasal mucosa. Experimental investigations of solutions with different pH shows the effect of solution with acid pH (4-6). Despite their evident numbers and variety, many of the presently known vasoconstrictors have their weaknesses and for this reason introduction of any new or improved preparation is worthy of evaluation.

Recently, we studied an interesting new vasoconstrictor, Otrivin.** It is an aromatic imidazoline derivative which is similar chemically and pharmacologically to Privine, a widely used vasoconstrictor. Otrivin is 2-(4-tert-butyl-2, 6-dimethylbenzyl)-2-imidazoline HCl. It has been reported clinically as having good effectiveness and low toxicity, while producing little or no rebound congestion. The manufacturer prepared the compound for evaluation in several strengths, and in combinations with a highly potent steroid, Ultracortenol,† and an antibiotic, neomycin. Ultracortenol produces the same physiologic effects as the adrenocortical hormones, cortisone and hydrocortisone. It has an anti-inflammatory, antiallergic activity 3 to 5 times that of cor-

The opinions expressed in this paper are those of the author and in no way reflect those of the Department of Defense or the Department of the Army.

* The materials used in this study were those of Ciba Pharmaceutical Products, Inc.

** (xylometazoline hydrochloride CIBA).

† (prednisolone trimethylacetate CIBA).

tisone and has a longer duration of action. Neomycin is well known as a broad spectrum antibiotic of very low antigenicity and has proven therapeutically effective against large numbers of gram-positive and gram-negative organisms usually found in respiratory ailments.

The purpose of our study was to determine whether or not Otrivin, alone or in combination, was effective in treating various otorhinological disturbances. We were also interested in determining the particular clinical indications best suited to local treatment with this new agent, its side effects and incidence of rebound congestion, if any.

Clinical Study

The study is based on observations made in 100 patients who came to the clinic with various nasal and sinus complaints. The conditions and numbers of patients were as follows:

1. Sinusitis—acute or chronic (52)
2. Ethmoiditis—acute or chronic (22)
3. Rhinitis—acute (23)
4. Eustachian tube inflammation—acute (5)
5. Otitis media—acute (3)
6. Allergic rhinitis (1)

Six patients had two of the diseases

The following solutions were used:

1. Otrivin 0.1%
2. Otrivin 0.05%
3. Otrivin 0.05% with Ultracortenol 0.2%
4. Otrivin 0.05% with Ultracortenol 0.05% and Neomycin 0.5%

Method of Treatment

The vasoconstrictors must be applied in such a way as to reach the site of the swelling and remain there. They are of no value if they are simply dropped into the nostril and allowed to run back along the floor of the nose into the naso-pharynx. For that reason each patient was instructed to use the nose drops according to the following instructions:

a. Close the nostril with forefinger.
b. Insert five nose drops in other nostril with head tilted backward.
c. Bend head forward between knees for ten seconds, with forehead lower than tip of nose.
d. Place head sideways on flat surface for thirty seconds.
e. Repeat above procedure with other nostril, if necessary.
f. Do this four times daily.

In cases of sinusitis and ethmoiditis, acute or chronic, for reaching the sinus-ostiae the following instructions were given the patient:

1. Take a piece of cotton, about the length of a cigarette with tweezers.
2. Soak well in the solution and insert it in affected nostril parallel to bridge of nose as far as possible.
3. Lie down on same side with head slightly lower than the body for three minutes.
4. Do same on opposite side when indicated.
5. Do this four times daily.
6. Do not fear swallowing. About one bottle a week will be required.

In chronic sinusitis and in acute conditions with much discomfort, pain or heavy and much purulent discharge the patients received subluxation of the middle turbinate and oral or local application of antibiotics (after culture and sensitivity test) in addition to the nose drops. On occassion, if results were unsatisfactory, after a reasonable length of time, we discontinued the use of nose drops and instituted other treatment.

Results

The interpretation of *excellent* is a subjective and objective response in a record time of 1-2 days. (Subjective response: diminishing of pain, pressure, and return of sense of well being.) (Objective response: changing of discharge from purulent to serous and restoration of normal passages in nose and middle ear.) *Very good, good,* and *fair* are gradually less objective and subjective improvement. *Poor* response: designates no improvement—or response—to Otrivin therapy.

Thirty-six patients who used 0.1% Otrovin

Sinusitis (17)	*Ethmoiditis (10)*	*Rhinitis (5)*
1 good	1 good	4 very good
6 very good	3 very good	1 excellent
10 excellent	6 excellent	

Allergy (1)	*Eustachian tube inflammation (3)*
1 excellent	1 very good
	2 excellent

Twenty-one patients who used 0.05% Otrivin

Sinusitis (7)	*Ethmoiditis (4)*	*Rhinitis (8)*
4 good	1 poor	7 good
2 very good	1 good	1 excellent
1 excellent	1 very good	
	1 excellent	

Eustachian tube inflammation (2)

1 very good
1 excellent

Twenty patients who used 0.05% Otrivin—Ultracortenol 0.2%

Sinusitis (12)	*Ethmoiditis (5)*	*Rhinitis (1)*
1 poor	1 fair	1 very good
2 fair	3 good	
6 good	1 excellent	
3 very good		

Otitis media (1)	*Eustachian tube inflammation (1)*
1 good	1 good

Twenty-three patients who used 0.05% Otrivin with Ultracortenol 0.05% and Neomycin 0.5%

Sinusitis (12)	*Ethmoiditis (3)*	*Rhinitis (7)*
1 fair	2 good	2 fair
7 good	1 very good	4 good
3 very good		1 excellent
1 excellent		

Otitis media (1)

1 good

An important clinical observation was the spacious opening of the nose, immediately after application of the drops. Relief of nasal occlusion lasted from three to twelve hours. Use of the drops caused no stinging, nor was rebound observed in any of the patients. Actually no side effects (subjective or objective as for blood pressure, etc.) occurred, except in one patient who experienced dryness of the throat.

Therapy with the drops was continued from 1 to 3 weeks in 95 of the patients and to 4 weeks in the remainder. Symptomatically, relief was obtained in 90% of the patients within 3 minutes and lasted several hours (3-12 hours). No toxic effects were observed on long-term usage. The objective symptoms and time of complete recovery appeared to be reduced by several days.

These same patients who had used other nose drops never achieved the same clinical response in results as they achieved with Otrivin. In the last few years, the common nose drops were used occasionally or not at all since they were generally found to be ineffective except possibly for short subjective relief.

Summary and Conclusion

One hundred patients suffering from a variety of nasal and sinus complaints, acute or chronic, were given a new nasal vasoconstrictor, Otrivin, alone or in combination with a potent steroid and an antibiotic. The preparation was highly effective and markedly lacking in rebound congestion or systemic side effects. Only two patients of the entire group experienced no relief and only one patient complained of any side effect (dryness of throat). Otrivin 0.1% was the best of the preparations.

It is my clinical impression that Otrivin and its combinations have a very definite place in the practice of the otorhinolaryngologist for the treatment of nasal and sinus inflammations and their complications.

This clinical trial indicates the ease and rapidity with which Otrivin 0.1 % resolves inflammation and hastens the recovery.

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References

[1] Alajmo, E.: The Action on the Mucous Nasal Membrane of Solutions with Different pH. *Clin. Otorhinolaringol. Univ. di Firenze,* 1956.

[2] Bumbalo, T. S.: Otrivin, a New Nasal Medication for Pediatric Use: An Evaluation. *Western Medicine,* May 1960.

[3] Hagen, W. J. and Trelles, M. G.: A New Local Decongestant of Unusually Low Toxicity. *The Eye, Ear, Nose & Throat Monthly,* 39: 56, Jan. 1960.

[4] Jacques, A. A. and Fuchs, V. H.: A New Topical Nasal Decongestant. *J. La. State Med. Soc.,* 3 (10): 384, Oct. 1959.

[5] Kolodny, A. L.: Ba-11391 (Otrivin), a New Imidazoline Vasoconstrictor with Lessened Side Effects—A Preliminary Clinical Report. *Antibiotic Med. & Clin. Therapy,* 6 (No. 8): 452, Aug. 1959.

[6] McNeill, M. D.: A New Topical Vasoconstrictor (Xylometazoline) (Otrivin) in Pediatrics. *General Practice,* April 1960.

[7] Peluse, S. J.: An Improved Topical Vasoconstrictor for the "Stuffy Nose"—A Preliminary Evaluation. *The Eye, Ear, Nose & Throat Monthly* 38: 936, Nov. 1959.

Patient Centered Ward Conferences

By
M. Marian Wood, R.N.*

THE patient centered ward conference is one of the best ways for nursing personnel to develop new understandings and to gain meaningful knowledge. The informal environment, the realistic value of the theme, and the possibilities for the immediate use of the conference embrace adult learning principles. The information and the discussion which centers around a patient with whom all participants are concerned makes for an excellent educational setting and results in new learnings of high value. This type of conference helps nursing personnel to better understand the physical and the emotional needs of patients and to improve the quality of their nursing care activities.

A professional nurse plans the ward conference. The use of allied disciplines will be dependent upon her plan for developing the conference and the indicated need for participants other than nursing personnel. Certain items of preparation may be enhanced by consultation with members of the allied professions who are concerned with the medical care program of the patient. The extent to which the different areas are to be developed will be a matter of professional judgment made after a preview of the patient to be presented.

Interest in the conference is sharpened if ward personnel are given the opportunity to submit the names of patients they would like presented at the conference. The nurse planning the conference considers all requests and then makes the final selection of the patient to be presented. She sees that the necessary preparation is made and leads the conference.

It is important that the patient centered conference be inclusive and highly informative as to the patient being presented. Although there are definite areas which need to be developed, the proportion of time is determined and individualized by the indicated needs of the particular patient. The conference should be built around the following areas:

1. Orientation of the group to the patient and his family.
2. The health problem of the patient.
3. The patient and his family's adjustment to the health problem.
4. A pooling of the observations made by nursing personnel.
5. The nursing care activities implicated by the medical care plan.
6. The identification of nursing care problems and their solution as immediate or projected plans.

In orienting the group to the patient and his family the patient's history will give many items of factual data. If good relations have been established with the patient and his family, supplementary data will easily manifest itself through conversation. Observations can often provide information which will help to see the patient as an individual. Areas of importance in understanding the patient are social status, economic status, psychological make-up, past health record, educational attainment, hobbies, religion, experiences in the world of work and family relationships. There may be other kinds of background information that are of importance to a particular patient. This kind of information gives a foundation for understanding the patient as an individual in the light of his life's experiences.

There are different means through which the health problem of the patient can be determined. The findings of the physician and his progress notes are often very valuable. Diagnostic studies, consultation reports, x-ray reports and laboratory reports may reveal important information. A knowledge of the disease or the medical condition and its

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usual course and prognosis will give scientific understanding to the particular patient's health problem. The coordination of the specific findings of the particular patient and the classical picture of the condition or disease give basic medical understandings. The leader may wish to confer with the ward physician and other allied disciplines in developing this area. This picture sets a perspective for certain elements of the nursing care plan.

The adjustment of the patient and his family to the health problem is significant and worthy of attention. Although the degree and manner of adjustment may be obvious, the leader must take means to discover hidden factors of adjustment which may exist. Observation of the patient and his family members many times will reveal pertinent findings. This kind of understanding is needed to plan the health teaching. The adjustment of the patient and his family to the health problem guides nursing personnel in the development of a post discharge plan, if one is indicated for the patient. This kind of information has a direct relationship on the patient's response to treatment and to the course of the disease.

Observations of the patient usually reflect considerable resourceful knowledge when properly interpreted. A pooling of all observations gives this area a vital part in the conference and provides an opportunity for all those in attendance to participate. These observations give insights into many personal characteristics, adjustment and personality factors which may not be revealed through any other means. Psychological needs are recognized through observations. Day to day observations indicate the manner in which the patient is adjusting to the hospital and his acceptance of his medical care program. It is through observations that a patient's desire to be dependent or his attitude toward self care and self sufficiency are discovered. Pooled observations aid nursing personnel to individualize and vitalize patient care activities and meet the specific needs of patients.

There is a very real place in the conference for a review of the nursing care activities which are needed to carry out or to support the medical care program. This encompasses all currently prescribed treatment. The physician is dependent upon nursing personnel in many instances for carrying out many items he prescribes in the medical care program for the patient. By making this a part of the conference all nursing personnel will be appraised of the role they are expected to assume in support of the physician. This may reflect on certain needs that can be met through health teaching. The medical care program may indicate the need for referrals or post discharge planning. As in other areas, the inclusion in the conference of the medical care program gives understandings of what the physician hopes to do for the patient.

The most meaningful and realistic part of the conference for nursing personnel will be the identification of nursing care problems and the solutions which have been formulated or are awaiting solution. This area gives heart and substance to the nursing care plan. All members of the group have an opportunity to take an active part by reporting observations and making suggestions for the care of the patient. It can be expected that the leader will interpret the needs of the patient and will evaluate all suggestions in terms of nursing care principles and the welfare of the patient. Successful efforts to meet the needs of patients and to solve patient care problems are reflected in making individualized plans for the patient. There is an opportunity to project plans for the patient and to forecast what nursing hopes to accomplish for the patient. An effective development of this area gives all those participating a common understanding of the patient and an appreciation for the role of creativity in designing nursing care plans.

The time and place of the conference are projected in advance so that all ward nursing personnel can plan their work for maximum attendance. The leader will use a conference technique. Certain parts will be developed through the giving of information. Other areas will be developed almost entirely by the

pooling of observations and suggestions. As for any conference, the leader may wish at times to use the participants as consultants to evaluate nursing care ideas. An important objective for the leader to realize is that all participants get answers to their specific questions. Team leaders and staff nurses inexperienced in the patient centered ward conference need guidance to make this technique an integral part of their activities. They will need assistance in the beginning to establish objectives for each conference. Individual guidance should continue until the nurse can function effectively and comfortably in the role of ward patient centered conference leader.

Accomplishment in the matter of the patient centered conference will be greater if a frequency is established for a given period of time and a simple reporting method is a part of the plan. Care needs to be exercised, especially in the beginning, that the number of conferences expected is not above that which can be comfortably undertaken. Once the technique is established the frequency could be evaluated and changed as indicated.

There are values for all who participate in a ward patient centered conference. This is one of the best means for the growth and development of non-professional nursing personnel. It provides the professional nurse with the opportunity for improving her nursing care activities and in addition provides her with opportunity to organize information and to develop skill in conference technique. Her insights into her role as a teacher are accentuated. Physicians who attend or actively participate report that they gain useful patient information.

Patient centered ward conferences are readily adaptable to the afternoon and the night tours of duty. It may be possible for nursing personnel on wards in close proximity to assemble for a conference during the night tour of duty. The unavailability of personnel from the allied disciplines either for consultation or participation necessitates that the nurse leader assume a more resourceful role. Most of the objectives of the patient centered conference can be realized on these tours of duty despite the necessary adaptation.

Summary

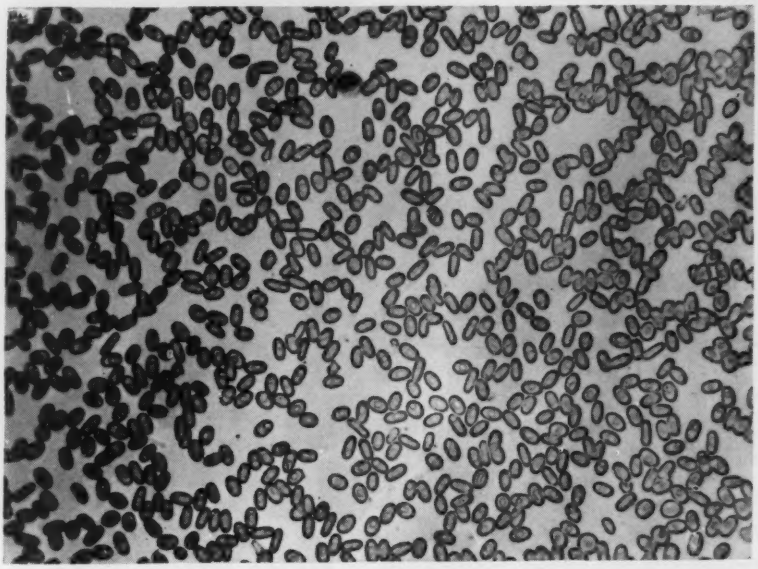
This article has established the patient centered conference as an effective learning tool for ward nursing personnel. Six areas to be developed for the conference have been presented. A few suggestions for making the patient centered ward conference a reality have been given. The values of the patient centered ward conference have been mentioned.

OVERSEAS MAIL

Packages for overseas must be mailed by November 20 to assure arrival by Christmas.

Case for Diagnosis

A young male recruit of German ancestry was hospitalized with measles, which ran the usual course. Erythrocyte count and hematocrit were normal. The peripheral blood smear is illustrated below. The patient's mother had a mild anemia, splenomegaly, and peripheral blood smear similar to his; and one of three siblings examined, though not anemic, also had similar changes in the blood smear.



AFIP Neg. No. 218829-13
For diagnosis, see page 873.

From the Medical Illustration Service of the Armed Forces Institute of Pathology, Colonel Frank M. Townsend, USAF, MC, The Director.

EDITORIAL

Executive Director

MAJOR GENERAL THOMAS J. HARTFORD, who at the time of his retirement on September 30 was Deputy Surgeon General of the Army, has joined the headquarters staff of our Association as Executive Director, effective October 15, 1961.

In announcing the appointment, Dr. Leroy E. Burney, president of the Association, said: "General Hartford brings to our Association his long years of experience in administration and military medical matters. He will give his full attention to the administration of the Association which will permit Colonel Robert E. Bitner to devote more time to expanding the services and influence of the Association as editor of MILITARY MEDICINE, our official journal."

A native of Omaha, Nebraska, General Hartford received his medical degree from the University of Nebraska in 1925. He served with the Nebraska National Guard and as a member of the Medical Corps Reserve until he entered the Regular Army in January 1931.

Some of the more important assignments held by General Hartford during his career include service as Surgeon of General Patton's Victorious Army in Europe and Surgeon of the Twelfth Army Group during World War II; Surgeon of the U. S. Army Pacific, and Commander of the U. S. Army Tripler General Hospital in Hawaii; Deputy Commander of Walter Reed Army Medical Center; and Commanding General of Madigan General Hospital, Tacoma, Washington.

He has been decorated with the Legion of Merit, the Army Commendation Medal, the Bronze Star Medal and upon his retirement the Distinguished Service Medal. He holds decorations from the French Government for outstanding service in World War II.

U. S. Army Photo

MAJ. GEN. THOMAS J. HARTFORD, USA, RET.

General Hartford's duties will be those pertaining to the overall management of the Association, a position which the Executive Council of the Association has for some time considered very much needed in the growth and important standing gained by our Association in recent years. The Executive Council has acted wisely.

The Association of Military Surgeons is indeed fortunate in having such a capable individual as General Hartford on its staff.

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Around the World

(Ser. IV, No. 11)

By
CLAUDIUS F. MAYER, M.D.

KINDIA, Dakar, Brazzaville, Tananarive, Addis Ababa, and other African towns south of the Sahara have received in recent decades their branches of the Pasteur Institute. The first overseas institute of this type was created in 1891 by Calmette at Saïgon. The latest one of three *"Instituts Pasteur Hors-Métropoles"* has just opened at *Bangui, in French Central Africa,* near the Congo. The construction of the new research and therapeutic institute cost 75 million francs of which more than half was supplied by the mother institute in Paris. Africa still hides many obscure diseases which are probably caused by unknown viruses. One of the great tasks of the new institute is to investigate African viruses which are transmitted by insects and are reared in some animal reservoirs. This institute is again a splendid example of humanitarianism of the French people who were often and unjustly accused of having been the exploiters of backward nations in their former colonies.

Similar other examples of Christian humanitarian work could be brought up from the recent history of other African states, for instance from the Congo. Under the Belgian colonial administration the *medical services for the Belgian Congo* were very good (we described it a few years ago). However, all the doctors were Belgian, and after their quick departure in July 1960, all medical control in the Congo completely collapsed. Savage intertribal warfare broke out, and many native medical assistants and orderlies were forced to flee for their lives from the hospitals to their own tribal areas. Many of them were slaughtered by tribesmen either in the hospitals or on the road. The Congo thus fell into total chaos. At this time, the International Red Cross came to the aid of the troubled country, and field teams arrived from various lands. A former member of the *Australian Red Cross Field Force* (B. W. Fox) recently reported on his surgical experiences which he gained in the Bakwanga and Luiza areas.

The Red Cross team first set up at the *native hospital of Disele,* formerly owned by a mining company. The hospital was well equipped, but there was no help and no water, food, or electricity. Operations were performed under sweltering conditions in swim trunks, with bare hands soaked in alcohol-iodine, and instruments sterilized by boiling in water carried by hand from a well some 300 yards away. Most *surgical interventions* were carried out under local or spinal anesthesia for lack of sufficient general anesthetics. The patients, even with the most mutilating injuries, were incredibly courageous, lying quietly on the ground. An interesting feature of some penetrating chest wounds was that the lung did not collapse because many of the injured Congolese had tuberculosis, and thus, they had numerous adhesions between the pleural surfaces, preventing the lung from collapsing. The patients invariably demanded that the bullets and shrapnel pieces that had been removed from their wounds should be shown to them, which was often inadvisable or inexpedient. Hence, the surgeon had to prepare in advance a collection of bullets of every kind, from which then he could select a suitable piece for demonstration and reassurance of the injured.

At the "town" of *Luiza, situated at the Kasai-Katanga* border, not far away from Angola, the Australian Red Cross surgeon found a hospital which, at the time of these activities, provided the only doctor for a native population of 300,000 people living near and far around the small town. Again, after June 30, 1960, the hospital had no water nor electricity. The x-ray machine was out of

order. With some tricks and some appropriation of oil, the hospital's diesel motor was restarted, and soon the hospital became a thriving concern again. In this hospital, which was out and away from the battle line, most of the *surgical work* was peace-time operations such as herniotomy (the largest number of cases), skin grafts, laparotomy for various reasons, salpingo-oophorectomy, operations for simple fractures, etc. including Cesarean sections. The *incidence of inguinal hernia* is very high in the whole Congo, mostly of the indirect type. Gynecological surgery is also often needed; especially so because of gonorrheal complications which are rather common.

Burns were often seen in epileptics who were overcome with seizures, while sitting around a fire. Other burns resulted from the *"art" of the village witch doctors* who prefer to apply boiling palm-oil to the skin over the region of any painful area. (Of course, the patient feels such excruciating pain from the hot oil that he has no time to think of his previous malady.) The Congolese are great hypochondriacs, and they will do any trick to be operated on. They are *expert malingerers* in producing all the subjective symptoms of excruciating abdominal pain. Thus, the doctor who does not know the Congolese mentality will often perform unnecessary laparotomies. On the other hand, abdominal tuberculosis is extremely common, and is the cause of many vague abdominal ailments. Among the interesting abnormalities, the doctor noted preauricular sinus, and *accessory digits,* which usually occurred in form of a sixth finger on side of the little finger. Those natives, who had them, regarded them as a good-luck sign, and refused to have them amputated.

Medicine and surgery in Africa has become a frequent topic in the medical literature of recent years, ever since the settlement of *Dr. Albert Schweitzer in Lambaréné,* Gabon. Two medical members of the Albert Schweitzer Hospital (R. M. Goldwyn, and R. L. Friedman) discussed their African experiences a few months ago in one of the American medical weeklies, and presented an *analysis of a year's operations.* Patients come there from all over French Equatorial Africa, at the rate of 4500 new patients a year. In a year's time, about 450 operations are performed among which the operations for hernia reach 48%, for hydrocele 5.6%, for the combinations of both 6.5%. Herniotomy thus seems to be the most frequent operation all over Africa. Another feature which is remarkable in African surgical statistics is the comparative lack of such civilized diseases as appendicitis, gallbladder troubles, peptic ulcer, breast cancer, or arterial insufficiency.

Albert Schweitzer's autobiography (*"Ma vie et ma pensée"*) has now been translated into many languages, but "My Life and Thought" (Lond., 1958) is much more than just an autobiography. He had a very rich life. As we know him now, at 86 years of age, he is a *missionary doctor* who won the Nobel Peace Prize in 1953. When he was 30 years old in 1905, he was not a physician, but a professor of protestant theology at Strasbourg, and preacher at St. Nicholas Church, and a great enthusiast of organ music and organ building. In 1905, he entered the Faculty of Medicine at Strasbourg University as a student with the ultimate goal in mind to go to the African jungle and to save the outcasts of that continent. The Dean of the medical school thought that he was out of his mind, and wanted to refer him to one of his colleagues in the psychiatry department. Schweitzer arrived at Lambaréné in 1913 where he started medical practice in an old hen-house. One of the first principles he found out early in his *African medical practice* was that among primitive peoples one must never try to give the patient or his family hope if there is no reason to hope. With native patients, one has *to speak bluntly, and tell them the truth.* Schweitzer was helped by his wife from the very beginning; she was a courageous nurse. Soon the *hen-house hospital* widened, and gave shelter to more and more patients daily. During the First World War, he and his wife were interned at the camp of Garaison, where he learned much practical knowledge. After his

return to Lambaréné, in 1924, he had to rebuild everything that the war and neglect had brought into disintegration and into ruin. Now, his world-famous hospital center offers housing to about 350 patients in sixteen corrugated-roofed, barrack-type dwellings. As a jungle hospital, it is magnificent; but as a modern hospital, it still has many shortcomings, lack of facilities (oxygen therapy, radiology, pathology, chemistry and bacteriology), and lack of a properly trained staff, which cannot be corrected easily, even with the support of such enthusiastic groups as the *"Friends of Albert Schweitzer" association.*

The tremendous health problems of awakening Africa are well illustrated also by the recent *malaria epidemic* which struck hard *at Ethiopia* and its 18 million inhabitants in 1958. In half a year, the disease claimed 3 million victims of which 100,000 died. The poor people died in their villages "like bees smoked in a hive." Actually, in some districts, the death rate from malaria was 20%. Unusual feature of the Ethiopian malaria epidemic was that it started more than three months earlier than its usual season; that it spread to an altitude of 6,500 feet where normally the malaria mosquito does not survive and where the mountain people had not had any previously acquired immunity against the disease. These mountainous regions are also the medically most neglected areas; many died, therefore, who could have been saved otherwise.

In another part of the world, in *Australia,* medicine is making great progress. We were impressed by the 24-page supplement of the Medical Journal of Australia (Aug. 5) which lists the *research projects in medicine and allied sciences* carried out by physicians, biochemists, pharmacists, etc., of the many universities, institutes and hospitals of Australia. It is hard to sample the titles of impressive research projects, but their range is very wide, beginning with the genetics of viruses, and ending in studies on the aging of ameba. The *Royal Hospital for Women, at Paddington,* listed a project of building an equipment for ultrasonic echographic studies of the pregnant abdomen. The *Kanematsu Institute of Sydney Hospital* investigates 15 patients who appear to be suffering from a new kind of hemopoietic disorder, tentatively termed "myeloproliferative disorder." This is on the boundary between benign and malignant hyperplasia of one or more bone-marrow elements. On the basis of this list, we may say that medical research in Australia is at a very high level, corresponding to that seen in the most prosperous countries of the world.

As to the *health of Australia,* the views of a medical professor at Perth (E. G. Saint) may be of interest. Measured by the crude yardstick of mortality rate, Australia is second only to the almost aseptic Scandinavian countries. The present *crude death rate* is 8.5 per 1000, and the infant mortality rate is 22 per live births. In terms of life expectancy, the life tables offer at birth 67 years for males, and 73 years for females. This is a great advance since the turn of the century when baby boys could not expect to live longer than 16 years, and girls not more than 18 years. Australia also has an *optimistic reproductive habit,* and the natural increase in population is currently 13%. The good fortune of Australian health is due to many factors among which the improvement of the living conditions had a predominant influence. The improvements came only after some political struggle and upheaval. In the history of Australian health and preventive medicine the figures of some leading politicians, who fashioned the instrument of modern government, are just as important as Koch and Ehrlich. There are still some blots on the otherwise clean bill of health, which require continued administrative vigilance. The ranking order of causes of death has also changed, as everywhere else, with the advancement of civilization. The order and likelihood is now: coronary, hypertension, stroke, bronchitis or pneumonia, injury on the Queen's highway, or by the own hand. Yet, Australia is still better off than America or Britain. The Australian men have a slightly less chance of dying of coronary heart disease (rate 297 per 100,000) than

Americans (347). Because the Australian air is purer, inhabitants are less likely than Englishmen to die of chronic bronchitis or lung cancer (lung cancer in Australia 24, in Britain 73 per 100,000). On the other hand, Australia is the most lethal to live in, as far as *road accidents* are concerned; there, the death rate on the roads is 37.5 per 100,000, which beats the U.S. by a few fractured skulls. There are also some interesting differences in the causes of death in the various Australian states. Queensland and Tasmania, for instance, have a lower death rate from coronary heart disease and from duodenal ulcer. Comparatively fewer Victorians commit suicide than Western Australians (70 against 120 deaths). Perhaps the social *factors of isolation and loneliness* are quantitatively significant in this instance.

Among the recent deaths of international medical significance, the name of Prof. Maurice LOEPER (1876-1961) occurs. By his activities in *medical journalism* and in organization of medical information, he became an outstanding leader of European medicine. He founded in Bruxelles the *International Union of Medical Press,* and in France he created recently (1955) the French Association for Medical and Surgical Information.

All over the world, sanitarians are worried about the *air pollution,* and the poison we breathe. The contamination of the air is becoming worse and worse. Here is an illustration of what is happening. In Mexico City, the average visibility until 1940 was between 10 and 20 Km over the city. Now it is hardly more than 4 Km. During fine weather, about 5 tons of dust and grit are deposited per square kilometer per week over the city (15 tons in the center). Great Britain's domestic fires emit yearly over a million tons of smoke, its industries produce another half a million, and its railways about 100,000 tons of smoke. Of course, every country *attempts to do something* about it. Australia prohibits dense smoke from industrial chimneys. Britain passed its *Clean Air Act* in 1956, which established some smoke control areas. In the Netherlands, the establishment of an industrial plant has to be approved by public health authorities. In the U.S.A., we have state, county and city regulations, though they are not very effective (with a few exceptions). In Russia, electric power plants can be established only with simultaneous installation of equipment for dust and ash absorption, and permissible levels of concentrations of noxious substances have been laid down for the atmosphere in towns.

A few months ago, the sixth scientific meeting of the Standing Advisory Committee for *Medical Research in the British Caribbean* was held at Bridgetown, Barbados. The general topic of the sessions was the impact of research on public health. Reports were presented from Jamaica, Barbados, British Guiana, Antigua, Trinidad, St. Lucia, etc. We learned that, at least in Barbados, the *child mortality* rate dropped. The principal *causes of death* in Jamaica are still pneumonia, gastro-enteritis, respiratory tuberculosis, malaria and syphilis. The tuberculosis mortality is the highest in the older age-groups. In Antiqua, the 19th century *tuberculosis death-rate* of 11% has now dropped to 4% in the negro population. At the sugar estates of British Guiana, *a high incidence of diabetes* was found in the East Indian male and African female population. Among the Negroes, cerebral hemorrhage and diabetic coma were the leading causes of death, while the East Indian mostly died from pulmonary complications and coronary thrombosis. Investigations for *Q fever* showed that this infection is not now prevalent in Jamaica. At Trinidad, mild cases of *leptospirosis* were found, especially during the rainy season. In St. Lucia, a recent malaria eradication campaign resulted in an almost complete disappearance of the disease. *Typhoid* still makes some outbreaks in the Caribbean islands. This is mostly a water-borne infection, since in some islands artesian wells must be used for water supply, and such wells were found contaminated in 32% of the cases. A group of interesting cases were reported from the San Fernando General Hospital (Trinidad). These were cases of *scorpion stings (by the Tityus trinitratis)* in which abnormal EKG

findings suggested the presence of toxic myocarditis. Such cardiac complication was not reported previously in the medical literature.

Penbritin is a new broad-spectrum penicillin developed in Great Britain as a result of an important discovery in 1959 by Beecham Research Laboratories. The advantages and indications of the new medicament were widely discussed in the July 22 issue of the British Medical Journal. The drug can be taken orally, and it has a very low toxicity, and freedom from side-effects.

France is facing a great political and demographic problem. It has been known for a long time that the birthrate in this European country has been steadily declining. One of the corrective measures was the *Law of 31 July 1920* which prohibited the advertisement and the sale of *anticonceptional devices*. Recently, the French socialist party proposed that the old law should be abolished. This should be done—they say—in the sacrosanct name of "Liberty." There is, however, a small minority among the socialists, which, instigated by the director of the French National Institute of Demographic Studies, is in opposition to any such attempt for moral, family, demographic, and economic reasons. Any reduction of the birthrate in France would lead not only to an economic disruption, but to a real suicide of the nation. The demo-Christians will, of course, stand firm at the declaration of the Catholic Church that any attempt to interfere with the natural consequences of the conjugal act is immoral. Strange enough, the French communists—for some other reasons—are in this question on the side of the Pope.

Meanwhile, poor India is struggling with its own population problem. Any suggestion which would provide *an inexpensive method of birth control* would appear to be welcome to the Indian government. From the Patna Medical College comes the latest suggestion that the Indian women should use cotton swabs soaked in supersaturated solution of common table salt before the conjugal meeting. About 63 women used this method over three years, and avoided conception. The salt is now prepared in the form of a demulcent jelly in collapsible tubes.

Cat-scratch disease or benign lymphoreticulosis was first described in France by Debré in 1950. It affects only man, and one species of ape. Cats are only the carriers of the still obscure agent of this affection, which is very mild, and may also follow scratches by a rose thorn or pork bone. The affection has *mostly a nuisance value*, because it has to be differentiated from a number of other possible affections that may involve the lymph nodes. It is thought that the cause is a virus of the lymphogranuloma type, though there is much against this assumption. The reservoir of the virus is still not discovered, neither do we know how the virus infects the cat. Hence, public health measures to control the infection cannot be taken. Who would have the heart, anyhow, to banish from the house one of man's most charming and useful companions? . . . *Multa paucis!*

NOTES

Timely items of general interest are accepted for these columns. Deadline is 1st of month preceding month of issue.

Department of Defense

Deputy Ass't Sec'y of Defense (Health and Medical), Off. Ass't Sec'y of Defense for Manpower—FRANK B. BERRY, M.D.

DISCUSSES PAPER

Dr. Frank B. Berry discussed the paper on the uses of preserved glycerolized frozen red cells which was presented by Captain L. L. Haynes, MC, USN, Chelsea Naval Hospital at the Annual Meeting of the American Association of the Surgery of Trauma in September.

DOCTOR DRAFT

The draft requirements for the Armed Services are: Medical Corps—Army, 275; Navy, 70; Air Force, 150. For the Dental Corps—Army, 154; none for the Navy or Air Force. For the Veterinary Corps—Army, 67; none for the Navy or Air Force.

This, along with the 185 called up in June 1961, is the first draft call for physicians since 1957; the first draft of dentists since 1955; and only the second call for Veterinarians.

As of September 20, 1961, 2238 applications for the Armed Forces Physicians' Appointment and Residency Consideration Program (Berry Plan) had been received. Of this number, 497 requested immediate active duty.

Army

Surgeon General—LT. GEN. LEONARD D. HEATON

Deputy Surg. Gen.—BRIG. GEN. HOWARD W. DOAN

DEPUTY SURGEON GENERAL

Brigadier General Howard W. Doan, the recently appointed Deputy Surgeon General for the Army, is a native of Illinois. He received his medical degree at the University of Iowa in 1932 and was appointed to the Regular Army Medical Corps in 1935. During World War II he was Executive Officer of the Chief Surgeon's Office, European Theater. From 1953-56 he was Superintendent of Gorgas Hospital in the Canal Zone. Prior to his assignment to the Surgeon General's Office as Director of Personnel, General Doan was Surgeon of the First U. S. Army. On October of this year he became Deputy Surgeon General.

U. S. Army Photo

BRIG. GEN. HOWARD W. DOAN, MC, USA

DIRECTOR OF PERSONNEL

Brig. General James E. Graham, MC, who has been consultant in surgery since July 1960, has succeeded Brigadier General H. W. Doan as Director of Personnel and Training in the Office of the Surgeon General.

A native of Indiana, a graduate of the Indiana University of School of Medicine (1930), General Graham entered on active military duty in 1934. He is a Diplomate of the American Board of Surgery and a Fellow of the American College of Surgeons.

ASSIGNMENTS TO SGO

Colonel Frederic J. Hughes, Jr., MC, USA, formerly Chief, Department of Medicine, Letterman General Hospital, is now Chief of the Medical Consultant Branch in the Consultant Division of the Directorate of Professional Service. He has succeeded Colonel Dan Crozier, MC, who is now Chief of the Medical Unit, U. S. Army Medical Research and Development Command, Fort Detrick, Maryland.

Lt. Colonel Henry J. Donnelly, MC, USA, as Chief, Preventive Medicine Research and Development Command.

Lt. Col. Ralph G. Le Moon, MSC, USA, assigned to the Medical and Dental Corps Procurement Branch of Personnel and Training Directorate.

Lt. Colonel Jacques L. Sherman, Jr., MC, USA, as Chief of the Medical Research Branch of the Research and Development Command.

METCALFE MEMORIAL FUND

The Raymond Franklin Metcalfe Memorial Fund Award was recently announced by the Surgeon General of the Army. This provides an annual award of $150 for any Regular Army Medical Corps officer (or officers) whose surgical research project or paper, initiated during residency training, merits special recognition.

The fund has been created by Mrs. Marjorie Metcalfe Nichol in memory of her father, the late Brigadier General Raymond Metcalfe, Medical Corps, U. S. Army, whose illustrious Army career spanned the years 1901-1946, except for six months' retirement preceding World War II. General Metcalfe died in 1947.

SURGEON, JAPAN

Colonel Everett G. King, MC, has assumed command of the U. S. Army Medical Command Japan and the position of Surgeon, U. S. Army Japan. He succeeds Colonel Louis S. Leland who will be stationed at Walter Reed General Hospital.

FOREIGN OFFICERS AT MFSS

Among the officers attending the 39-week course in hospital administration at the Medical Field Service School, Brooke Army Medical Center are: Colonel Luis R. Podesta-Jimenez from Peru; Lt. Colonel Akhundzada Mohammed Yusel, Pakistan; Major John Patrick McKenna, Canada; Major Chung Kyeongseop, Korea; Captain Luis Roberto Rodriquez-Bello, Venezuela; Captain Mehdi Sedehizafh, Iran; Captain Van Thieu Ha, Vietnam; Lieutenant Mario Lazo-Meynard, Nicaragua.

LADY PHYSICIAN BECOMES COLONEL

Dr. Clara Raven, a pathologist, Chief of the Laboratory Service of the 323rd General Hospital, was recently promoted to the grade of colonel in the U. S. Army Reserve Medical Corps.

Colonel Raven is Deputy Medical Examiner of Wayne County, Michigan, with office in Detroit.

Colonel Raven served in the Army during World War II and was assigned to the European Theatre. She has also served in Japan. More recently she was assigned to the Armed Forces Institute of Pathology but in 1958 returned to civilian life. Her present work involves extensive examinations in homicides, suicides and accidents.

PODIATRIST

Second Lieutenant Richard G. Macdonald, commissioned to that rank recently, is the 19th podiatrist to be commissioned in the Army. He has been assigned to Fort Carson, Colorado, where he will set up a new Podiatry Clinic.

U. S. Army Photo

SECOND LIEUTENANTS MARY H. HUSTON, JACQUELINE M. LAVIN, JOICY M. PUTNAM, MARY PAT VAN TINE; JANE C. VICKERY.

PHYSICAL THERAPISTS

At Walter Reed General Hospital five young ladies recently finished their training as Physical Therapists. They are all college graduates. They received 8 months of didactic instruction at the Brooke Army Medical Center, Fort Sam Houston, Texas, then five months of supervised clinical practice at Walter Reed General Hospital. Now they will be engaged in the actual practice of physical therapy for 11 months in the Army. This will complete their obligation. Of course, they may elect to remain on active military duty.

MILITARY NURSING PRACTICE AND RESEARCH PROGRAM

A new program in Military Nursing Practice and Research has been launched at the Walter Reed Army Institute of Research. Head of the program is Lt. Colonel Harriet H. Werley, ANC, Chief, Department of Nursing. Attending the 40-week course are Army nurses Major Lenore M. Moseley and Captains Katherine F. Galloway, Elenore F. Sullivan and Rosemary T. McCarthy.

The curriculum is designed to highlight areas of importance to the military, such as: trauma and general surgical conditions; communicable diseases; radiobiology from the health and hazard aspects; some of the psychosocial aspects of practice; cardiovascular-respiratory-renal condition; the biological and chemical weapons, and generally the matter of medical services preparedness for national disaster.

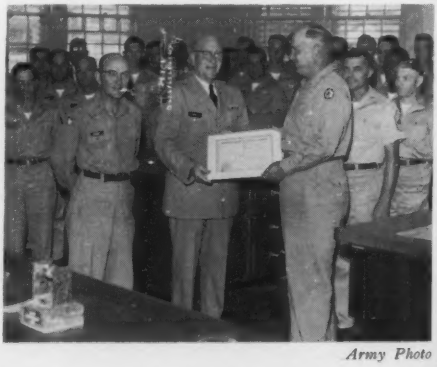
TO COSTA RICA

Col. George W. Hunter, III, USA, Retired who has been teaching Parasitology in the Department of Microbiology, College of Medicine, University of Florida, has secured a leave of absence. He has been appointed Research Professor in Medical Parasitology at the Louisiana State University School of Medicine in the Department of Tropical Medicine and Medical Parasitology.

Dr. Hunter will be working in the new LSU International Center for Medical Research and Training (ICMRT) which will be located in San Jose Costa Rica. He will be gone about a year and will be accompanied by his wife.

A SUPERIOR RATING

Five successive years of a superior rating for the Central Dental Laboratory, Brooke Army Medical Center, Fort Sam Houston, Texas, earned for it a Certification of Achievement.



Army Photo

COL. WILLIAM M. REAM (center) accepts the Certificate of Achievement from MAJ. GEN. JOHN F. BOHLENDER, Center Commander. BRIG. GEN. CLARENCE P. CANBY, Director of Dental Activities at the Center, is on the left.

RETIRES

Colonel William E. Jennings, VC, USA, who has been head of the veterinary services of the Fifth U. S. Army, Chicago, recently retired after 27 years of military service. On his retirement he was awarded the Army Commendation Medal and Certificate of Achievement for distinguished service.

Colonel Jennings has assumed his new duties as Director of Food Hygiene Services for the State of New York with headquarters in Albany.

ANTI-MALARIA PILL

A new anti-malaria pill is now available as a standard item after a successful field test in Korea.

The pill, a combination of chloroquine and primaquine, is the result of studies conducted by Dr. Alf S. Alving of the University of Chicago under a contract with the U. S. Army Medical Research and Development Command.

The new pill is as efficacious as the old method in which the pills were given separately over a period of many days. Now one pill a week while the person is in a malaria area is sufficient. The pill even has a coating to disguise its bitter taste! How far we have come from the days of quinine!

STAINING TECHNIQUE FOR PARASITES

A new staining technique which uses acridine orange and related dyes has been developed for the rapid detection of parasites. This has been the work of the Walter Reed Army Institute of Research, Washington.

By means of this technique *viable* microfilariae were demonstrated for the first time in the circulating blood of dogs, indicating the presence of "canine micro-filariasis." Human filarial parasites can be just as readily detected in whole blood preparations.

Because of the simplicity of the technique large scale surveys can be conducted in the field.

Navy

Surgeon General—REAR ADM. EDWARD C. KENNEY

Deputy Surg. Gen.—REAR ADM. ALLEN S. CHRISMAN

RETIRED

The following officers of the Navy Medical Department have been placed on the Retired List: Captains Frederick H. Bradshaw, DC; Charles F. Hoyt, DC; Francis V. Lydon, DC; George H. Mills, DC; and William A. McLennan, DC. Also Nurse Corps officers: Commanders Rita V. O'Neill, Elizabeth Seidl, and Marjorie Von Stein.

PERSONAL

Dr. James R. Brayshaw, former officer in the U. S. Navy Medical Corps, has been appointed to a position in the Biological Sciences and Systems Department of the General Motors Defense Systems Division. He will head the Cardio-vascular Group of the department under the supervision of Dr. Norman L. Barr.

Air Force

Surgeon General—MAJ. GEN. OLIVER K. NIESS

Deputy Surg. Gen.—MAJ. GEN. RICHARD L. BOHANNON

CITATION OF HONOR AWARD

The 1961 Citation of Honor Award of the Air Force Association was bestowed upon Major General Oliver K. Niess, Air Force Surgeon General, for his contributions to the national aerospace and clinical research medical programs.

The citation reads: "The Air Force Association pays tribute to Major General Oliver K. Niess, USAF, who, as Surgeon General of the United States Air Force has displayed outstanding professional leadership in the planning and achievement of national aerospace medical objectives."

In accepting the award, General Niess stated: "I am pleased to accept this Citation of Honor Award in behalf of the men and women of the Air Force Medical service, whom I symbolize here today. Their dedicated medical research efforts and vital contributions to the U. S. space mission have been recognized by an observant Air Force Association. I am personally grateful for the honor that has been bestowed upon the Medical Service."

PROMOTION

Brigadier General Larry A. Smith, USAF, MC, was promoted to that rank in September. General Smith has been Director of Medical Staffing and Education in the Office of the Surgeon General of the Air Force since 1959.

A native of Noonan, North Dakota, he received his medical degree from Northwestern Medical School in 1939 and then entered on active military service. He is a Senior Flight Surgeon and specializes in internal and aerospace medicine.

PERSONAL

Lt. Colonel V. Harry Adrounie, USAF, MSC, President of the National Association of Sanitarians has been assigned as commander, Detachment 10, 1st Aeromedical Transportation Group, Mather Air Force Base, Calif. He will act as Air Force adviser to Headquarters, 3rd Aeromedical Evacuation Group (Reserve) and its component units.

RADIATION OF BIOLOGICAL SPECIMENS

What effect does space radiation have on biological specimens. This is a constant study that is being made at the School of Aerospace Medicine, Brooks Air Force Base, Texas.

Recently a capsule of biological specimens was recovered from Discoverer #29 after it had made a number of orbits of the earth. These will be thoroughly studied.

To record the amount of radiation on these trips dosimeters are used in the capsule.

ANOTHER 17-DAY TEST

Two jet pilots, First Lieutenants Melvin Pollard and Craig Bernon, 23 and 24 years respectively, are the youngest men ever to serve as subjects in the space Cabin at the USAF Aerospace Medical Center, Brooks Air Force Base, Texas.

The 17-day test was conducted with a cabin pressure and atmosphere the same as at sea-level. In previous test an altitude of 35,500 feet was simulated and the subjects were given pure oxygen to breathe.

Lieutenants Pollard and Miller were given dehydrated foods and recycled body water throughout the test. They were observed constantly for any reaction that might have occurred in the 8 × 12 foot cabin.

Public Health Service

Surgeon General—LUTHER L. TERRY, M.D.
Deputy Surg. Gen.—JOHN D. PORTERFIELD

ASSIGNMENT

Dr. James Watt, who has been director of the National Heart Institute has assumed the new position as Director of the Division of International Health, U. S. Public Health Service.

In making this assignment, Surgeon General Luther L. Terry said: "The time is here when we must marshal and strengthen all our forces to assist our neighbors everywhere on the face of the earth in the battle against sickness and disease. Currently, the Service has a budget in excess of $16,000,000 for our varied international health activities which include our international research and research training program and our scientific exchange program with the USSR. We expect this amount to increase sharply in 1962 and we expect also that many of our programs which do not now have international implications will become involved."

REASSIGNMENT

Dr. James K. Shafer has been designated as the Health Advisor, Office of Emergency Planning, Washington.

The Office of Emergency Planning is a

new office resulting from the division of the responsibilities of the former Office of Civil and Defense Mobilization. Some of the responsibilities of this latter office have been transferred to the Department of Defense.

Dr. Shafer, a member of the Regular Corps, Public Health Service, is a graduate of the University of Nebraska Medical School. He received his master's degree in public health from Johns Hopkins University. He is General Chairman of this year's Annual Meeting of the Association of Military Surgeons.

PERSONAL

George F. Archambault, immediate past chairman of the APhA Council, pharmacy liaison officer to the Office of the Surgeon General of the U. S. Public Health Service, and chief of the pharmacy branch, Division of Hospitals, USPHS, was elected to the office of President-Elect of the American Pharmaceutical Association in a record vote of nearly ten thousand ballots.

Installations of officers of the APhA will be at the annual meeting in Las Vegas, Nevada, the week of March 25, 1962.

EXAMINATION FOR REGULAR CORPS

Competitive examinations for appointment of physicians as Medical Officers in the Regular Corps of the United States Public Health Service Commissioned Corps will be held throughout the United States on February 13, 14, and 15, 1962.

Active duty as a Public Health Service officer fulfills the Selective Service obligation for military duty.

Applicants must be under 34 years of age for appointment to Assistant grade; under 37 for Senior Assistant grade. Entrance examinations will include an interview, physical examination, and comprehensive objective examinations in the appropriate professional fields.

Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service (P), Washington 25, D.C. Completed forms must be received no later than January 5, 1962.

RETIRED

Dr. John W. Knutson, who has been Chief Dental Officer of the Public Health Service since June 1952, retired October 1. He has been appointed to a joint Professorship at the University of California in Los Angeles as Professor of Preventive Dentistry in the School of Dentistry and as Professor of Public Health Administration in the School of Public Health.

FROM PHS TO PRIVATE PRACTICE

Jose L. Silva who has been Senior Surgeon in the Public Health Service with station in Oklahoma City has entered into the private practice of Internal Medicine and Pulmonary Diseases at 490 Washington St., Wellesley, Mass.

PUBLIC HEALTH TRAINEESHIPS

More than 600 doctors, nurses, and other professional health workers were awarded public Health traineeships during fiscal year 1961. These awards have provided trainees with monthly stipends while they are taking graduate or specialized courses in public health at universities throughout the country.

Almost half of the traineeshhips (299) went to nurses who will work in health departments and other agencies. Sanitary engineers were second with 79; health educators, third with 52; and physicians next with 42. Dentists, statisticians, and laboratory technicians were among other categories represented.

Preference in traineeships is given to qualified younger applicants who are new to public health. To be eligible, an applicant must have completed his basic professional education, be accepted by a school of his choice that conducts a nationally recognized public health training program, and plan to enter full-time public health employment.

HEALTH FACILITIES BILL

The community health facilities bill which was approved by Congress will give States an opportunity to expand the health services for chronically ill and will provide more

funds for raising home construction and construction of health research facilities. Centers for rehabilitation will also be provided for.

ISONIAZID

Prevention of tuberculosis in household contacts was started as a field trial four years ago by the Public Health Service. It was found that isoniazid was 80% effective in preventing the disease among 12,000 household contacts when daily doses of the drug were given. Just how long this protection will last is not yet known.

This news shows how important it is to examine every contact of a case of tuberculosis and assures them of a reasonable means of preventing the disease if such measures as the isoniazid administration are put into effect. Other measures are to be considered by the physician; such as proper diet, rest, and moderation in exercise.

Prophylaxis with isoniazid is certainly an advance in the ever waging campaign against tuberculosis.

LEUKEMIA

Virus has been extracted from the blood of laboratory rats having a virus-caused leukemia. This report was recently made by Doctors Albert J. Dalton and John B. Moloney who conducted the work at the Laboratory of Viral Oncology, National Institutes of Health.

The work was done with the aid of high speed centrifuges and the electron microscope.

POLLUTED AIR

What effect does polluted air have on the human? We all have our ideas. We all know that it is disgusting to stand on the street or be in a car in the vicinity of a motor bus or passenger car or a truck when these are belching forth the noxious gases that pollute the air.

Not too soon is a study to be made of the effect of such air on animals. This study is to be made at Wayne State University in Detroit and will be under the supervision of Dr. Arthur J. Worwald, Professor and Chairman of the Department of Industrial Medicine and Hygiene.

More than 4,000 experimental animals—rats, guinea pigs, rabbits, and mice will be used in the study of pulmonary function, length of life, blood studies, and pulmonary pathology.

The animals will be divided into three groups, the first of which will breathe exhaust-contaminated air pulled in directly from a heavily traveled street through a large duct especially constructed for the study. The second group will be exposed to the normal urban air present in the laboratory. The third group will be housed in a room containing specially cleansed air, from which almost all impurities will have been removed.

This study will be made under a Public Health Service contract.

WISTERIA POISONING

Poisoning of children who ate wisteria pods has been reported to the Poison Control Centers. One child became acutely ill after eating only two seeds from the wisteria pod. All victims recovered.

The common symptoms of wisteria poisoning are repeated vomiting, nausea, abdominal pain, diarrhea, and abdominal swelling.

The National Clearinghouse for Poison Control Centers serves 450 local centers and is in the USPHS Division of Accident Prevention, Washington. Information on thousands of poisonous substances is available from this source. Local centers have access to this information.

Since there are so many substances that have poisonous ingredients in them a physician would have much trouble keeping in contact with all the fine details. Therefore he should be thoroughly acquainted with the Poison Control Center in his area.

DISABILITY DAYS

Disability Days (PHS Pub. #584-B29) is a 50-page booklet giving facts on disability in the United States in the period, July 1959-June 1960.

Illness and injury caused the American

people to stay home from work, stay in bed, or otherwise cut down their usual activities for an average of 16 days per person, including six days of bed disability. This is four days less than the same period which ended June 30, 1959. In that year there was an Asian influenza epidemic.

The report can be obtained from the Government Printing Office for 40¢.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—H. MARTIN ENGLE, M.D.

MEMBERS TO ADVISORY GROUP

Five new members have been appointed to the Special Medical Advisory Group of the Veterans Administration. They are: Dr. Jack R. Ewalt who succeeds Dr. Howard P. Rome; Dr. Lewis A. Leavitt who succeeds Dr. Charles D. Shields; Dr. Robert D. Ray who succeeds Dr. Harold A. Sofield; Dr. William B. Wartmen who succeeds Dr. Shields Warren; and Miss Helen L. Bunge, who succeeds Mrs. Marion S. Bailey. Retiring from the group at the end of his term is Dr. Frank L. Weston

The new chairman of the group is Dr. Barnes Woodhall, dean and professor of surgery of Duke University School of Medicine. Dr. Woodhall had been serving as vice chairman. The new vice chairman is Dr. Thomas H. Brem, University of Southern California School of Medicine, Los Angeles.

NEW TITLES

Heads of Veteran Administration hospitals, domiciliaries, centers, and independent outpatient clinics will now be known as *directors* of these stations rather than managers.

Directors of professional services are now *chiefs of staff*, and assistant directors of professional services for research and education are *associate chiefs of staff*.

CANCER

Of the more than 30,000 cases of cancer treated in Veterans Administration hospitals each year it has been found that the lungs, skin, and prostate gland, in that order, are the most frequent sites.

Tabulations regarding cancer are being made at the VA Central Cancer Registry to which 124 Veterans Administration hospitals report the cases. Other data are being accumulated such as type of treatment, length of life, types of cancers, age, race and sex and geographical factors. It appears to be too early to give out information on some of these other points.

WANTED

Manual arts therapists and hospital housekeeping officers for vacancies that exist in many Veterans Administration hospitals. Those interested can obtain more information by visiting any VA hospital or writing to the Personnel Service, Department of Medicine and Surgery, Veterans Administration, Central Office, Washington 25, D.C.

Miscellaneous

DIAGNOSIS OF CASE

The diagnosis of the case on page 857 is hereditary elliptocytosis. The abnormality of the erythrocyte is inherited as a simple Mendelian dominant trait, not sex-linked. It is usually asymptomatic, but may be associated with anemia of hemolytic type.

PRESIDENT-ELECT

The American Academy of Physical Medicine and Rehabilitation has elected Max Karl Newman, M.D., 16861 Wyoming Avenue, Detroit 21, to be President-elect of that Academy.

STAFF EDUCATION FOR NATIONAL DEFENSE

The Mayo Foundation through its Education Program Committee will present first to its consultants of the clinic and then to the resident physicians and members of the nonmedical staff a concentrated 8-hour course in civil defense.

This will be done during December, 1961,

and January, 1962. The course will include information on nuclear bombs, chemical weapons, biologic warfare, management and treatment of mass casualties, and preparations which should be made to ensure protection and survival of families.

MEDICO NEEDS PHYSICIANS

Surgeons, internists, general practitioners, and anesthesia specialists are needed in Afghanistan, Cambodia, Vietnam, Malaya, Laos, and Haiti by MEDICO.

Further information may be obtained by writing to MEDICO, Inc., 420 Lexington Avenue, New York 17.

MEDICOLEGAL FORMS

The American Medical Association has revised and expanded its edition of *Medicolegal Forms with Legal Analysis.* We consider this a must booklet for all hospitals and physicians. Lawyers would do well to have a copy also. Price is $1.00 per copy and is obtainable from the American Medical Association, 535 North Dearborn St., Chicago 10, Ill.

SPEAKERS AVAILABLE

"The Medical Revolution," a 20-minute talk, can be arranged for civic and professional groups by Ciba Pharmaceutical Products, Inc., Summit, New Jersey.

The 60 men who give this talk have completed an intensive course in speech training.

PG COURSE

Internal Medicine—Today's Problems in Diagnosis and Management, and Tomorrow's Projections is a postgraduate course that will be given at the Ochsner Foundation, New Orleans, January 15-18, 1962.

Further information can be obtained through the Executive Offices of The American College of Physicians, 4200 Pine St., Philadelphia 4, Pa.

PG COURSE ON DIABETES

The Tenth Postgraduate Course *Diabetes in Review: Clinical Conference, 1962,* will be held January 17, 18 and 19 in Detroit and Ann Arbor, Michigan. Further information may be obtained from the American Diabetes Association, 1 East 45th St., New York 17, N.Y.

ORAL SURGERY CONFERENCE

The *First International Conference on Oral Surgery,* sponsored by the American Society of Oral Surgeons in conjunction with the Royal College of Surgeons of England will be held at the Royal College in London, July 1-4, 1962.

Further information can be obtained from the American Society of Oral Surgeons, 840 North Lake Shore Drive, Chicago 11, Ill.

ALLERGISTS CONGRESS

The American College of Allergists Graduate Instructional Course and Eighteenth Annual Congress will be held April 1-6, 1962 at Hotel Radisson, Minneapolis, Minn.

For further information write to: John D. Gillaspie, M.D., Treasurer, 2141 14th St., Boulder, Colorado.

TETANUS

According to Dr. Edward S. Stafford, Baltimore, there has been no case of tetanus that has developed in any World War II veteran. This speaks well for tetanus toxoid which all military personnel received.

It should not be forgotten, however, that a booster injection of the tetanus toxoid is in order in case of certain types of injury. The use of tetanus antitoxin (manufactured from horse serum) should be limited to those who have not had tetanus toxoid.

While tetanus cases are reported in the United States the disease is far from the magnitude of importance that it is in many foreign countries.

EPILEPSY

It is estimated that there are 1,500,000 Americans afflicted with epilepsy. The National Epilepsy League, Inc., which has been organized to assist physicians and patients has headquarters at 208 North Wells St., Chicago 6, Ill.

Honor Roll

Since the publication of our last list, the following sponsored one or more applicants for membership in the Association:

Lt. Col. Evelyn M. Bedard, USAF, NC
Maj. L. T. O'Desky, MC, USAR
1/Lt. Col. A. Barrett, MC, USAR
Capt. Fred Friedman, D.D.S.
Lt. Col. A. Banett, MC, USAR
A. B. C. Knudson, M.D.

New Members

Lt. Col. Robert Harry Lang, USAF, MC
Cdr. H. J. Civiello, MSC, USN
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Lt. Robert B. Arnold, MC, USNR
Lt. Arthur E. Halprin, DC, USNR
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Lcdr. Waldo B. Lyon, MSC, USNR
Lcdr. George E. Balyeat (MC), USNR
Lt. Jimmie Dow Scott, MSC, USNR
Lt. John J. Costanzi, M.D., MC, USAF
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Lt. Orlando Stallings, MSC, USN
LCmdr. James L. Clifford, USPHS
Lt. Arsenio C. Comas, USAF
Lt. Donald G. Browning, MC, USAR
Capt. Arline F. Love, USAF, NC
Capt. Herschel E. Mozen, MC, USA
Major David J. Geigerman, MC, USAR
Cdr. H. W. Combs, MSC, USN
Lt. Paul E. Tyler, MC, USN
Cdr. Royce K. Skow, MSC, USN
Capt. John L. Thompson, Jr., USA, DC
Capt. Lawrence Patrick McCormick, DC, USAF
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Cdr. Bernard F. Duwel, MC, USN
DCdr. Rita A. Sieland, NC, USN
Lt. Col. Morton Shainess, MSC, USAR
Capt. Lewis A. Leavitt, MC, AUS, Ret.
Lt. Cmdr. Lloyd F. Teter, MC, USNR

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Lt. Col. Carl J. Schopfer, MC, NJNG

Death

LEVEN, Aaron Samuel, M.D., D.P.H., died at Beverly Hills Doctors Hospital on August 23 at the age of 64. Death was due to a myocardial infarct.

Dr. Leven was a native of Russia and came to the United States at the age of seven. He received his medical degree (1919) and D.P.H. from the Kansas City College of Medicine and Surgery. He interned at the USPHS Hospital #54, Arrowhead Springs, California. A pioneer in the field of Industrial Medicine and Surgery, he practiced in Chicago for 25 years; for the 16 years prior to his death he engaged in the practice of General Medicine and Surgery in the Los Angeles area. He received a Presidential Citation for his work in the Administration of the Selective System, and was an officer in both World War I and II.

He is survived by his widow who resides at 566 Stassi Lane, Santa Monica, California.

AWARDS

Presented during the 68th Annual Meeting,
Mayflower Hotel, Washington, D.C., November 6, 7, and 8, 1961

THE SIR HENRY WELLCOME MEDAL AND PRIZE

The Sir Henry Wellcome Medal and Prize is awarded annually through the Association of Military Surgeons of the United States by the Trustees of the Wellcome Foundation in London. The award is based on essays submitted in the annual competitive contest and consists of a Silver Medal, a scroll, and an honorarium of $500. The winner of the 1961 award is Captain Austin D. Potenza, Medical Corps, U. S. Army, Chief of the Department of Experimental Surgery, Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D.C. His essay, "Detailed Evaluation of Healing Processes in Canine Flexor Digital Tendons," was adjudged the best of the fifteen essays submitted. It will be published in the January 1962 issue of MILITARY MEDICINE.

Captain Potenza is a native of Brooklyn, New York. He was awarded the Bachelor of Science Degree cum laude in 1950 by Brooklyn College and also received a Phi Beta Kappa key. The Doctor of Medicine Degree was awarded to him by the State University of New York College of Medicine, New York City, in June 1954. After an internship at Walter Reed General Hospital he was commissioned in the Regular Army Medical Corps and later completed his residency in orthopedic surgery. At Walter Reed Army Institute of Research he is engaged in the investigations pertaining to tendon healing, bone growth, the dynamics of bone circulation, and the patho-physiology of chronic osteomyelitis, and tumors of the hand.

Captain Potenza is a member of the Faculty of Georgetown University Medical School.

CAPT. AUSTIN D. POTENZA, MC, USA

THE GORGAS MEDAL

The Gorgas Medal is awarded for distinguished work in preventive medicine for our Armed Forces. The award was established by Wyeth Laboratories of Philadelphia in memory of Major General William Crawford Gorgas whose work in preventive medicine made possible the construction of the Panama Canal. This award consists of a Silver Medal, a scroll, and an honorarium of $500.

The Gorgas Medal for 1961 is awarded to James R. Shaw, M.D., a Medical Director of the U. S. Public Health Service, and Chief of the Division of Indian Health of that Service, Washington, D.C.

The award was given for Dr. Shaw's initiative and leadership in advancing health measures among the American Indians.

Dr. Shaw, a native of Yale, Michigan, holds a life certificate from Michigan State

USPHS Photo

JAMES R. SHAW, M.D.

Normal School. He taught high school and coached athletics before studying medicine. He received his medical degree from Michigan in 1936 and then entered the U. S. Public Health Service. He is now Chief of the Division of Indian Health, Bureau of Medical Services, Public Health Service. Dr. Shaw is responsible for the medical and public health services of some 400,000 Indians and Alaska natives.

THE MAJOR LOUIS LIVINGSTON SEAMAN PRIZE

The Major Louis Livingston Seaman Prize is made possible through funds left for that purpose with the Association of Military Surgeons of the United States by Major Louis Livingston Seaman, a Surgeon of the First U.S. Volunteers, Spanish-American War. The prize is given for some notable article published in MILITARY MEDICINE during the year, and consists of a scroll and an honorarium of $160.

The Prize is awarded this year to Major Charles E. Coner, MSC, USA, who at the time of submitting his article for publication was assigned to the U.S. Army Nuclear Medicine Research Detachment, Europe. He is now assigned to the Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D.C.

Major Coner's paper, "The Radioactively Contaminated Patient Under Combat Conditions," was published in the June 1961 issue of MILITARY MEDICINE.

THE FOUNDER'S MEDAL

The Founder's Medal is awarded by the Executive Council of the Association of Military Surgeons of the United States for meritorious service in the field of military medicine and for some notable work done for the Association.

The recipients of this Medal for 1961 which carries with it a scroll are:

James K. Shafer, M.D., Health Advisor, Office of Emergency Planning, Washington, D.C.; and General Chairman of the 68th Annual Meeting of the Association of Military Surgeons of the United States.

Thomas J. Kennedy, Jr., M.D., Assistant to Director of Laboratories and Clinics, National Institutes of Health, Bethesda, Maryland; and Chairman, Scientific Program Committee, 68th Annual Meeting.

THE STITT AWARD

The Stitt Award was established in 1954 by Pfizer Laboratories Division, Charles Pfizer and Company, Inc., New York, to honor the memory of Rear Admiral Edward Rhodes Stitt, a Surgeon General of the Navy who made outstanding contributions to tropical medicine. It is given for some notable work in medicine.

The Award consists of a bronze plaque, an honorarium of $500 and Life Membership in the Association of Military Surgeons of the United States.

The recipient of the Award for 1961 is Colonel Joe Blumberg, MC, USA, Deputy Director of the Armed Forces Institute of Research, Washington, D.C. The award was

COL. JOE M. BLUMBERG, MC, USA

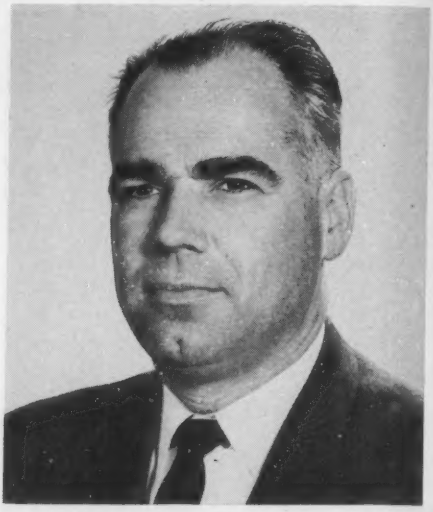
made on the basis of his recognition of the importance of the neuromuscular junction and the research that he has done on the subject.

Colonel Blumberg is a native of Baltimore, Maryland. He received his medical degree from Emory University in 1933. He entered on active military duty in 1941 and during World War II was on duty in the European Theatre. Early in his medical career he specialized in pathology and has filled many important positions in that field.

THE McLESTER AWARD

The McLester Award was established in 1954 by the J. B. Roerig Company Division, Charles Pfizer and Company, Inc., New York, to honor the memory of Colonel James Somerville McLester, MC, USAR, Birmingham, Alabama. The award is presented to a person who is, or has been at any time a commissioned officer, or has held relative status in the Federal Medical Services, and who has done some outstanding work in the field of Nutrition and Dietetics. The award consists of a bronze plaque and an honorarium of $500.

The recipient of the 1961 McLester Award is Mrs. Adelle C. Pitman, Chief, Nutrition Service, Regional Office, Veterans Administration, Houston, Texas.



CDR EDWARD L. ALPEN, MSC, USNR

THE SUSTAINING MEMBERSHIP AWARD

This Award which was established in 1958 by the Sustaining Members of the Association is given to a person in the Federal Medical Services who has made some outstanding contribution in the field of research. The individual may be on an active or inactive status with the Federal Medical Services. The award consists of a scroll and an honorarium of $500.

The 1961 Sustaining Membership Award is made to Edward L. Alpen, Ph.D., Commander, Medical Service Corps, U. S. Naval Reserve, who is Head of the Biological and Medical Sciences Division, U. S. Naval Radiological Defense Laboratory, San Francisco, California. The award was made in recognition of Dr. Alpen's important and far reaching contributions in the field of the biological effects of ionizing radiation.

ANDREW CRAIGIE AWARD

The Andrew Craigie Award was established in 1959 by the Lederle Laboratories, Division American Cyanamid Company, Pearl River, New York. This award honors the memory of Andrew Craigie, first Apoth-

NEW BOOKS

Medicine Makers of Kalamazoo. By Leonard Engel. 261 pp., illustrated. McGraw-Hill Book Company, Inc., New York, Toronto, London. Price $4.50.

The Medicine Show. Some Plain Truths about Popular Remedies for Common Ailments. By the Editors of Consumer Reports. With Introduction by Dexter Masters. 250 pp. Simon and Schuster, New York. Price $3.95.

A Manual of Pregnancy Testing. By Edward H. Hon, M.D. With Foreword by Somers H. Sturgis, M.D. 116 pp., illustrated. Little, Brown and Company, Boston. Price $5.00.

An Atlas of Ophthalmic Surgery. By Conrad Berens, M.D., F.A.C.S., and John Harry King, Jr., M.D., F.A.C.S. With Foreword by Edward Hartmann. 623 pp., 273 illustrations, with drawings by Robert Bray Wingate, A.B., M.S. J. B. Lippincott Company, Philadelphia, Montreal. Price $28.00.

Surgery. Principles and Practice. 2nd Ed. Edited by Henry N. Harkins, M.D., Ph.D.; Carl A. Moyer, M.D.; Jonathan E. Rhoads, M.D., D.Sc. (Med.) and J. Garrott Allen, M.D. With 30 contributors. 1595 pp., 652 illustrations. J. B. Lippincott Company, Philadelphia, Montreal. Price $17.00.

Oral Medicine. Diagnosis and Treatment. 4th Ed. By Lester W. Burket, A.B., D.D.S., M.D., Sc.D. With a Chapter on Oral Cancer by S. Gordon Castigliano, B.A., B.S., M.D., F.A.C.S. 609 pp., 420 illustrations, including 40 subjects in color. J. B. Lippincott Company, Philadelphia, Montreal. Price $15.00.

Color Atlas of Oral Pathology. 2nd Ed. By Robert A. Colby, D.D.S., M.S.; Donald A. Kerr, D.D.S., M.S., and Hamilton B. G. Robinson, D.D.S., M.S. 201 pp., 485 figures in color. J. B. Lippincott Company, Philadelphia, Montreal. Price $14.60.

Roentgenographic Cephalometrics. Proceedings of the Second Research Workshop Conducted by the Special Committee of the American Association of Orthodontists. Edited by J. A. Salzmann, D.D.S. 195 pp., illustrated. J. B. Lippincott Company, Philadelphia, Montreal. Price $4.75.

A Short Manual of Venereal Diseases and Treponematosis. 2nd Ed. By R. C. L. Batchelor, M.A., M.B., Ch.B., D.P.H., F.R.C.S.E., F.R.C.P.E., and Marjorie Murrell, M.R.C.S., L.R.C.P., M.B., B.S., D.P.H., F.R.C.S.E. 316 pp., illustrated. The Williams & Wilkins Co., Baltimore. Price $6.00.

Textbook of Medical Treatment. 8th Ed. By Various Authors. Edited by Sir Derrick Dunlop, B.A. (Oxon.), M.D., F.R.C.P.Ed., F.R.C.P. Lond.; Sir Stanley Davidson, B.A., M.D., Hon. M.D. (Oslo), F.R.C.P. Ed., F.R.C.P. Lond.; and S. Alstead, C.B.E., M.D., F.R.C.P. Ed., F.R.C.P. Lond., F.R.F.P.S. 983 pp., illustrated. The Williams & Wilkins Company, Baltimore, exclusive U.S. agents. Price $12.50.

The Cervix Uteri and Its Diseases. By C. Frederic Fluhmann, B.A., M.D., C.M. 556 pp., illustrated. W. B. Saunders Company, Philadelphia, London. Price $14.00.

Respiration in Health and Disease. By R. M. Cherniack, M.D., M.Sc., F.R.C.P.(C.) and L. Cherniack, M.D., B.Sc., M.R.C.P. (Lond.), F.R.C.P. (C.), F.A.C.P. 403 pp., illustrated by Nancy Joy, A.O.C.A. W. B. Saunders Company, Philadelphia, London. Price $10.50.

Medicine and the Navy 1200-1900. Vol. III—1714-1815. By Christopher Lloyd, F.R.Hist.S., and Jack L. S. Coulter, F.R.C.S. With Foreword by Surgeon Vice-Admiral Sir Cyril May, K.B.E., C.B., M.C., F.R.C.S. 402 pp., illustrated. The Williams & Wilkins Co., Baltimore, exclusive U.S. agents. Price $10.00.

Pathology. 4th Ed. Edited by W. A. D. Anderson, M.A., M.D., F.A.C.P., F.C.A.P. With 34 contributors. 1389 pp., with 1385 illustrations and 7 color plates. The C. V. Mosby Co., St. Louis. Price $18.00.

Psychopathology of Aging. The Proceedings of the Fiftieth Annual Meeting of The American Psychopathological Association, Held in New York City, February 1960. Edited by Paul H. Hock, M.D., and Joseph Zubin, Ph.D. 321 pp., illust. Grune & Stratton, New York, London. Price $9.75.

Williams Obstetrics. 12th Ed. By Nicholson J. Eastman and Louis M. Hellman. 1230 pp., 666 illust. Appleton-Century-Crofts, Inc., New York. Price $16.00.

The Pharmacologic Principles of Medical Practice. A Textbook on Pharmacology and Therapeutics for Medical Students, Physicians, and the Members of the Professions Allied to Medicine. 5th Ed. By John C. Krantz, Jr., and C. Jellef Carr. 1498 pp., illust. The Williams & Wilkins Company, Baltimore. Price $15.00.

The Myocardium—Its Biochemistry and Biophysics. (Symposium—December 9-10, 1960, New York City). Originally published in *Circulation*, Vol. XXIV, No. 2, Part 2, August 1961. Guest Editor:

Alfred P. Fishman, M.D. 120 pp., illust. American Heart Association, Inc., New York. Price $2.50.

Escape and Survival: Clinical and Biological Problems in Aero Space Medicine. AGARDograph No. 52. Edited by P. Bergeret. 119 pp., illust. Pergamon Press, Inc., New York. Price $6.50.

The Historical Development of British Psychiatry. Vol. I. 18th and 19th Century. By Denis Leigh. 282 pp., illust. Pergamon Press, Inc., New York. Price $10.00.

Family Constellation—Theory and Practice of a Psychological Game. By Walter Toman, Ph.D., of Brandeis University. Springer Publishing Co., Inc., New York. Price $4.50.

Arithmetic for Nurses: Programmed for Class Use and Home Study. By Marilyn Ferster, M.A., Indiana University. 112 pp. Springer Publishing Co., Inc., New York. Price $2.50.

Toward Therapeutic Care. A Guide for Those Who Work with the Mentally Ill. Prepared by members of GAP (Group for the Advancement of Psychiatry). Springer Publishing Co., Inc., New York. Price $2.50.

Clinical Orthopaedics. No. 20. Editor-in-Chief: Anthony F. DePalma. 272 pp., illust. J. B. Lippincott Company, Philadelphia, Montreal. Price $7.50.

Practical Pediatric Dermatology. 2nd Ed. By Morris Leider, M.D. 437 pp., illustrated with 280 photographs and 15 drawings. The C. V. Mosby Company, St. Louis. Price $13.75.

British Medical Bulletin, Vol. 17, No. 3, September 1961 (Completing the Volume). *Human Genetics.* 264 pp., illust. The British Council, London. Price $3.25 each copy.

Scientific Exhibits. By Thomas G. Hull and Tom Jones. With Foreword by Charles H. Bramlitt, M.D. 126 pp., illust. Charles C Thomas, Springfield, Ill. Price $6.50.

GRAND ROUNDS #10

LESIONS OF THE BRAIN: STROKE, HEAD INJURY, AND PARKINSONISM

A closed circuit telecast for physicians with a distinguished panel of clinicians, including three guests from other countries will originate from the Albert Einstein College of Medicine in New York City on Wednesday evening, December 13, 1961 (9 P.M. Eastern Standard Time).

The telecast may be seen in the following cities: Boston, Chicago, Cleveland, Kalamazoo, Los Angeles, Minneapolis, New York (Manhattan and Bronx), Philadelphia, Pittsburgh, San Francisco, Syracuse, Washington, D.C.

Physicians should check with the local medical society to ascertain the exact place in the above cities.

BOOK REVIEWS

CHEST PAIN. Systematic Differentiation and Treatment. By Nathaniel E. Reich, M.D., F.A.C.P., F.C.C.P.; and Rudolph E. Fremont, M.D., F.A.C.P., F.C.C.P. 366 pp., illust. The Macmillan Company, New York. Price $9.00.

In this book the Doctors Reich and Fremont present a systematic approach and review of the many, many conditions that cause chest pain. The clinical pictures, differential diagnostic findings, laboratory, Roentgen and electrocardiographic findings of significance are described in a very factual and up-to-date manner and, in most instances, logical therapeutic suggestions are proffered.

Besides morbid entities involving the chest walls, and thoracic organs of respiration, circulation, and digestion, the authors have carefully brought into consideration abdominal conditions which often cause diagnostic confusion in actual clinical practice. As might be expected, diseases of the heart and aorta are given the lion's share of attention and these chapters are particularly well covered.

This book would be of interest to internists, generalists, thoracic surgeons and others faced with difficult problems in diagnosis and management of chest pain. The book is well planned, has excellent illustrations, and the publishers have done a splendid job of printing. Most of the information prescribed in this book is available, however, in other texts employing disease entity rather than the anatomical approach.

CAPT. JULIAN LOVE, MC, USN, Ret.

CALCULATIONS IN PHARMACY. By Sue H. Rouse, M.S., and M. George Webber, Ph.D. 234 pp. J. B. Lippincott Company, Philadelphia and Montreal Price $5.00.

Graduates from high school, and many from college appear to have marked deficiencies in mathematics, which hampers them throughout their professional careers. This requires intensive efforts on the part of faculties of professional schools to indoctrinate such students into practical uses of mathematical procedures, including simple arithmetic, without regard to any theoretical background (which many students lack).

The authors have prepared a very readable book for students in pharmacy, to supply this need. There is a review of simple basic mathematics, including a number of problems to test the absorption of information presented. The metric system is presented in detail, followed by the apothecary and the avoirdupois and tables for conversion. (In the opinion of the reviewer we should delete both apothecary and avoirdupois and stick to the metric system, without continuing the attempt to educate in both systems, with the frequent errors resulting from failure to properly convert from one to the other.) Methods of changing doses, calculating percentages, density, ratios strength, concentration and dilution are presented with a good discussion on alligation. Interconversions of C. to F. are presented, followed by calculations of commercial importance. A useful chapter is given on the preparation of Isotonic Solutions. To aid the student, the last 12 pages give the answer to the problems previously presented.

The book presents a condensed outline of arithmetic and simple mathematical calculations, and would be useful for training and reference for pharmacists in school and in the pharmacy.

JAMES C. MUNCH

SURGERY FOR NURSES. 7th Ed. By James Moroney, M.G., Ch.G., F.R.C.S. (Eng.), L.R.C.P. (Lond.) 792 pp., 621 illust. The Williams & Wilkins Co., Baltimore, exclusive U.S. agents. Price $7.50.

This book was prepared by an English physician for use in the education of English nurses. It appears that certain additions in this edition were made in response to requests by English sister tutors. There are a large number of areas covered in this book including surgery, immunization, medical conditions, bacteriology, deformities, gynecology, and obstetrics. The brief space allotted for each area shows discriminating judgment in the weighing and selecting of basic facts and information.

The title of this book is misleading by our standards. Any library carrying this text would need to publicize its contents. There is some difference in terminology as used in this country but not to the extent that it detracts from the use of the book. There are many illustrations and they are well selected.

This book has value for student nurses as supplementary reading or as a reference book for professional nurses who have sound and scientific resourceful knowledge.

M. MARIAN WOOD, R.N.

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Ravdin, I.S.: J.A.M.A. 171:1357 (Nov. 7) 1959.

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